THE EFFECTS OF DIDACTIC INSTRUCTION AND PERFORMANCE FEEDBACK ON PARAEDUCATORS' USE OF POSITIVE BEHAVIOR SUPPORT STRATEGIES IN INCLUSIVE SETTINGS

by

Emily Eyrolles Sobeck

BS.Ed., California University of Pennsylvania, 2007

M.Ed., California University of Pennsylvania, 2011

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This dissertation was presented

by

Emily Eyrolles Sobeck

It was defended on

April 4, 2016

and approved by

Steven R. Lyon, PhD, Associate Professor, Department of Instruction and Learning

Douglas Kostewicz, PhD, Associate Professor, Department of Instruction and Learning

Amy Srsic, EdD, Assistant Professor, Department of Instruction and Learning

Benjamin Handen, PhD, Professor, Department of Psychiatry

Dissertation Advisor: Rachel Robertson, PhD, Assistant Professor, Department of Instruction and Learning

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Emily Eyrolles Sobeck, Ph.D.

University of Pittsburgh, 2016

With the shift to inclusive practices and with legislation (IDEIA, 2004; NCLB, 2001) mandating that students with disabilities be educated in the least restrictive environment (LRE), the educational service delivery for both students with disabilities and the paraeducators that provide support services has evolved. The responsibilities of paraeducators have shifted from duties that were primarily clerical in nature to now supporting students with disabilities, both instructionally and behaviorally. At the very least paraeducators are now providing academic instruction, serving as interventionists, communicating with parents, and adapting instructional materials. Although paraeducators assume a variety of roles, many paraeducators have no formal education beyond high school and are provided with minimal professional development once on the job. As more schools turn to inclusionary practices the impetus for highly qualified and trained paraeducators becomes of even more importance. Examination of the current paraeducator training literature reveals that research on paraeducator training is not only limited, but also contains several areas of methodological weakness. Although several training approaches have been investigated with paraeducators, the current paraeducator training literature does not provide evidence in support of the most effective way to provide training to paraeducators.

Therefore, the following study aims to expand the research base by analyzing the general and comparative effectiveness of didactic instruction and performance feedback on paraeducators' use of positive behavior support strategies with students with disabilities in inclusive settings. Further, this study also seeks to strengthen the current literature base on paraeducator training by improving on the areas of methodological weaknesses addressed in the review. Implications for practice and future directions for research are also discussed.

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PREFACE

Support for this research was provided in part by Grant No. H325D110001 of the U.S. Department of Education, Office of Special Education Projects, awarded to the University of Pittsburgh.

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1.0 INTRODUCTION

In recent years the field of education has shifted to more inclusive educational practices for students with disabilities. As these inclusionary practices become the norm, including students with disabilities in the general education environment is projected to continue to grow in frequency (U.S. Department of Education, 2002). Inclusion has become a focus of school practice due to both the academic and social benefits it provides students with disabilities (Harrower & Dunlap, 2001). Research has shown that when students with disabilities participate in inclusive environments they have an increased level of active engagement (Hunt, Doering, Hirose-Hatae, Maier, & Goetz, 2001) and learn targeted academic skills (Wolery, Werts, Caldwell, & Synder, 1994) while also experiencing greater social acceptance (Evans et al., 1992) and developing friendships with non-disabled peers (Hendrickson, Shokoohi-Yekta, HamreNietupski, & Gable, 1996). Inclusion has also become a focus of school practice due to the mandates set forth by legislation (Harrower & Dunlap, 2001). While the federal legislation for students with disabilities does not include the term “inclusion,” the least restrictive environment (LRE) requirement from the Individuals with Disabilities Education Improvement Act (IDEIA) serves as the basis for interpretation and practice. IDEIA, as amended in 2004, requires that school districts educate students with disabilities in the LRE and meet their specific needs within these environments with supports and services (IDEIA, 2004).

The focus, both in legislation and in school practice, on providing services to students with disabilities in inclusive settings, has dramatically redefined the role of paraeducators who often provide these support services (Giangreco, Edelman, Broer, & Doyle, 2001). The duties of paraeducators have evolved from duties that were primarily clerical in nature to now providing both instructional and behavioral support to students with disabilities in inclusive settings (Tews & Lupart, 2008). With most school districts allocating paraeducator support to help meet the needs of students with disabilities (Fisher & Pleasants, 2012), the use of paraeducators has become a common practice (Hall et al., 2010). More than 400,000 full-time paraeducators are employed nationally to support school age students who receive special education services (U.S. Department of Education, 2010), often spending the majority of the school day supporting these students in inclusive environments classroom (Patterson, 2006). Many schools are now employing more special education paraeducators than certified special education teachers (Giangreco, Hurley, & Suter, 2009). Not only are paraeducators employed and utilized more, but their role has also evolved dramatically (Killoran et al., 2001). In the general education environment paraeducators are now assuming some responsibilities traditionally carried out by certified teachers (Maggin et al., 2009). Although paraeducators are now providing 1-to-1 academic instruction (Hall et al., 2010), delivering whole class instruction (McKenzie & Lewis, 2009), communicating with parents (Riggs and Mueller, 2001), and adapting student academic materials (Maggin et al., 2009). A large part of their role also focuses on providing both adaptive and behavioral support services to students in inclusive settings. Specifically paraeducators are now serving as primary behavior interventionists (Fisher & Pleasants, 2012), facilitating student-peer interactions (McKenzie & Lewis, 2009), collecting student behavior data, managing student behavior, and providing personal care support (Maggin et al., 2009). Several research studies

have examined the specific daily tasks that paraeducators carry out in the public school setting. Giangreco and Broer (2005), Carter and colleagues (2009), and The Study of Personnel Needs in Special Education (2000) all found that paraeducators generally spend a substantial portion of their workday implementing behavior management plans and providing behavior support. An additional survey study completed by Fisher and Pleasant (2011) revealed that the most frequently reported role engaged in by paraeducator was providing behavioral and social supports to students.

With the expanding role of paraeducators, both No Child Left Behind (NCLB) and IDEIA mandate that paraeducators participate in some form of training. Section 1119 of NCLB directs school districts to allocate funds to ongoing training. However, the parameters of such training are not described (No Child Left Behind [NCLB], 2002). Similarly, section 1412 of IDEIA mandates that paraeducators be "appropriately trained and supervised," but the amendment does not provide any further guidance on specific training requirements (Individuals with Disabilities Education Improvement Act [IDEIA], 2004). With a lack of guidance from legislation on the parameters of paraeducator training, school districts are left to rely solely on the recommendations from the current paraeducator training literature base.

Unfortunately, the research base surrounding paraeducator training has been shown to be limited (Giangreco, Suter, & Doyle, 2010) and identified as one of the least experimentally investigated areas of special education (Giangreco et al., 2001). This limited research base reveals that paraeducators often lack the necessary training needed to support students with disabilities (Maggin et al., 2009) as training is generally unavailable, deficient, or limited in content (Hall et al., 2010). With formal training not routinely provided to paraeducators both special education and regular education teachers often attempt to fill this void by providing on-

the-job training for paraeducators, even though they may not be prepared to do so (Fisher & Pleasants, 2012). Teachers are rarely adequately prepared through pre-service education or in-service professional development to effectively supervise and provide ongoing training to paraeducators (French, 2001; French & Pickett, 1997; Fisher & Pleasants, 2012; Morgan, Ashbaker, & Forbush 1998). Although the placement of paraeducators is intended to help students with disabilities succeed in various school settings, the deficient amount of training paired with supporting the most challenging students, has been shown to hinder the social and academic objectives of the students they support (Giangreco, Smith, & Pinckney, 2006; Giangreco, Suter & Doyle, 210). Further, as paraeducators assume more responsibility within inclusive environments, concerns have emerged in the field as to whether the increase and change in responsibility is matched with the appropriate training. For example, although providing behavior support has shown to be a primary responsibility of paraeducators Sobeck and Robertson (Under Review) and Carter and colleagues (2009) found that many paraeducators feel that they are not adequately trained or prepared to handle many of the behavioral situations that arise during their workday. Concerns regarding training stem in part from both the training needs associated to different environments (i.e., resource classroom vs. inclusive classroom) and the reality that paraeducators and special education teachers now spend the majority of their day in separate environments (Patterson, 2006).

As more school districts look to inclusive practices (Minondo et al., 2001) the impetus for highly qualified and trained paraeducators becomes of even more importance. Further, due to a lacking body of empirical literature, it is unclear what guidance the research base provides on training paraeducators who support students with disabilities (Giangreco, Suter, & Doyle, 2010).

Currently, paraeducator training remains one of the least investigated and potentially most significant areas of special education (Giangreco et al., 2001).

1.1 STATEMENT OF THE PROBLEM

In light of the evolving role of paraeducators and the movement towards inclusion, there is a need for research examining the training approaches used to prepare paraeducators to provide effective and meaningful support to students with disabilities. Further, determining the most effective way to train paraeducators also provides school leaders with guidance on the most efficient way to use the allocated training hours for paraeducators. Without proper training paraeducators can negatively affect the academic, behavioral, and social growth of their students, ultimately hindering the specific objectives set forth by inclusion. Although didactic instruction and performance feedback are prominent approaches within the teacher training literature base, the effectiveness of each approach has been studied minimally with paraeducators. Further, no studies have been found that assess the comparative effects of these approaches.

Within the limited number of experimental studies that focus on paraeducator training, few studies have incorporated performance feedback as a training approach. Further, these studies also tend to focus on student-specific skills, rather than universal and foundational evidence-based strategies. Given that paraeducators are allocated a limited amount of time for training and being that they serve a diverse range of students in inclusive settings, researchers need to examine both the approaches being used to train paraeducators, as well as the content focused on during these training sessions. The following study evaluates the general and

comparative effectives of didactic instruction and performance feedback on paraeducators use of foundational positive behavioral support strategies in inclusive settings.

2.0 LITERATURE REVIEW

With most public schools transitioning to partial or full inclusion over the last decade, (Zigmond, Kloo & Volonino, 2009) the role of paraeducators has drastically evolved. Paraeducators are not only assuming some responsibilities that were once carried out by teachers in the past (Keller, Bucholz, & Brady (2007), but are now performing these tasks in inclusive environments (Patterson, 2006). In order to equip paraeducators with the tools they need in order to carry out these important and newly acquired responsibilities with fidelity, providing high quality training is vital. A systematic review of paraeducator training would help to identify the content most often focused on during trainings as well as the most utilized approaches within both past and current research. Bringing awareness to these elements will help to guide future research when designing and evaluating paraeducator training programs, as well as provide insight for school leaders on providing professional development for paraeducators. Although there is a range of literature relative to paraeducator training (e.g., descriptive studies, qualitative studies), focusing specifically on experimental studies that evaluate the effectiveness of training packages specifically for paraeducators would provide both researchers and practitioners with much needed guidance. Identifying the ways that previous research has addressed each aspect of paraeducator training is necessary in order to develop and deliver high quality training for paraeducators, specifically those who are now serving students in inclusive settings. In this chapter, a review of the research literature on paraeducator training was completed that addresses

the following questions: (1) Who is participating in paraeducator training? (2) What is being taught to paraeducators during training sessions? (3) What approaches are being used to train paraeducators? (4) What implications does the methodological quality of each stay have on the reported outcomes?

2.1 SEARCH METHODS

2.1.1 Search Procedures

Three computerized databases (i.e., PsycINFO, PsycArticles, and ERIC) provided the foundation for the initial search. Descriptors and all possible truncations included *paraeducator, paraprofessional, teaching assistant, training, professional development, special education,* and *disabilities.* An ancestral search of identified articles and related literature (Fisher & Pleasant, 2013; Giangreco, Suter, & Doyle, 2010;) followed the computerized search. A hand search of two relevant journals (i.e., *Journal of Special Education* and *Exceptionality*) completed the search.

2.1.2 Inclusion Criteria

Studies included in this review were selected based on five specific criteria. To meet criteria for this review, studies had to:

1. be published English and in a peer-reviewed journal.
2. be conducted within the United States of America. Due to educational institutions

varying greatly among countries (Baker & LeTendre, 2005), studies in this review were limited to those conducted in the United States.

3. be carried out in a public school setting, including the paraeducator training sessions. Studies that completed paraeducator training at an outside agency facility (Bingham, Spooner, and Browder, 2007) were excluded.
4. employ an experimental study. Descriptive studies (e.g., surveys, observations, and case studies; Fisher & Pleasants, 2012) were not included.
5. include student participants that are in grades kindergarten through 12th grade. Studies including early childhood settings (Hall, Grundon, Pope, Romero, 2010; Schepis, Ownbey, Parsons, & Reid, 2000), adult day programs environments (Barnes, Dunning, & Rehfeldt, 2011) and community-based settings (Bolton & Mayer, 2008) did not meet inclusion criteria.
6. include students that have a diagnosed disability. Studies that did not contain a student with a diagnosed disability did not meet inclusion criteria (e.g., students that were identified as having reading difficulty; O'Keefe, Slocum, Magnusson, 2011).
7. target student adaptive an/or behavioral skills. Studies that focused on student academic skills were not included (Owens, Fredrick, & Shippen, 2004).

2.1.3 Literature Search Results

The computerized search using the PsycINFO, PsycArticles, and ERIC databases yielded 226 peer-reviewed articles. Of the generated articles, 11 empirical studies met the inclusion criteria. Ancestral searches of the resulting 11 articles and the hand-search did not return any additional

studies. Overall, the literature search process identified 11 empirical studies published in nine different journals. A list of the included studies is shown in Table 1.

Table 1. *Summary of the 11 studies included in the literature review.*

Study	School	Classroom	Design
Brock & Carter (2013)	Varied	Unspecified	Randomized Controlled Trial
Causton-Theoharis & Malmgren (2005)	Elementary	Inclusive Classroom	Multiple Baseline Across Participants
Feldman & Matos (2012)	Elementary	Inclusive Classroom	Multiple Baseline Across Participants
Koegel, Kim, & Koegel (2014)	Elementary	Inclusive Classroom	MBL Across Participants
Maggin et al. (2012)	Middle	Special Education	Concurrent Multiple Baseline Across Participants
Malmgren et al. (2005)	Elementary	Inclusive Classroom	Multiple Baseline Across Participants
Martella et al. (1993)	High School	Special Education	Multiple Baseline Across Behaviors
McCulloch & Noonan (2013)	Elementary	Special Education	Multiple Baseline Across Participants
Quilty (2007)	Elementary	Various Locations	Multiple Baseline Across Participants
Robinson (2011)	Elementary	Inclusive Classroom	Multiple Baseline Across Participants
Toelken & Miltenberger (2012)	Elementary	Inclusive Classroom	Multiple Baseline Across Behaviors

2.2 RESULTING STUDIES

2.2.1 Settings and Participants

Table 1 contains information on the range of settings across all 11 studies. The studies included male and female paraeducators providing support services to students with disabilities in elementary (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Malmgren et al., 2005; McCulloch & Noonan, 2013; Quilty, 2007; Robinson, 2011; Toelken & Miltenberger, 2012), secondary settings (Maggin et al., 2012; Martella et al., 1993), or both elementary and secondary classrooms (Brock & Carter, 2013). Researchers examined paraeducators who provided support services in inclusive environments (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012, Malmgren et al., 2005; Robinson, 2011; Toelken & Miltenberger, 2012), special education or self-contained resource rooms (Maggin et al., 2012; Martella, 1993; McCulloch & Noonan, 2013), and both inclusive and self-contained settings (Quilty, 2007). One set of authors did not specify the type of setting in which the study was conducted (Brock & Carter, 2013).

Paraeducators included in this review varied in age, race/ethnicity, work experience and educational level. Table 2 displays the demographics of paraeducator participants included in the 10 single-subject studies and Table 3 displays the demographics of paraeducator participants included in the one randomized controlled trial (RCT). A total of 29 paraeducators were included across the 10 single-subject studies and 25 paraeducators were included in the RCT study. Paraeducator age was reported for eight of the included studies (Brock & Carter, 2013; Feldman & Matos, 2012; Maggin et al., 2012; Malmgren et al., 2005; Martella et al., 1993; McCulloch & Noonan, 2013; Robinson, 2011; Toelken & Miltenberger, 2012) and ranged from

18 years to over 60 years of age (Brock & Carter, 2013). Paraeducator race/ethnicity was reported for nine of the included studies (Brock & Carter, 2013; Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; Malmgren et al., 2005; McCulloch & Noonan, 2013; Quilty, 2007), however Brock and Carter (2013) limited their reporting to just two categories, Caucasian and other than Caucasian. Race/ethnicity ranged across paraeducator participants including: Caucasian, Hispanic, Mexican American, European American, and Hawaiian. Specific race/ethnicity information can be found in Table 3 and Table 4. Work experience was reported for nine of the included studies (Brock & Carter, 2013; Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; Malmgren et al., 2005; Martella et al., 1993; Quilty, 2007; Robinson, 2011) and ranged from 3 months (Robinson, 2011) to 20 years (Malmgren et al., 2005). All of the studies included in the review reported the paraeducators' level of educational attainment. Specifically, across all studies 47% (n=25) of paraeducators reported a high school diploma as their highest education attainment, 5% (n=3) reported completing some college courses, 5% (n=3) said they had an associate's degree 8% (n= 2) said they had an associate's degree, 39% (n=21) confirmed an earned bachelor's degree, and 4% (n= 2) confirmed an earned master's degree.

A total of 29 student participants across 10 studies are included in this review. One set of authors did not include student participants (Brock & Carter, 2013). Table 4 contains the students' demographics, including the identified disability category of each student participant. Student participants' ages ranged from 4 years (Toelken & Miltenberger, 2012) to 14 years of age (Maggin et al., 2012). Across all 29 student participants 93% (n = 27) were male and 7% (n = 2) were female. Of the 10 studies, six reported the race/ethnicity of the students (Causton-

Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; McCulloch & Noonan, 2013; Quilty, 2007), while four neglected to include this information (Malmgren et al., 2005; Martella et al., 1993; Robinson, 2011; Toelken & Miltenberger, 2012). Race/ethnicity ranged across student participants including: African American, Chinese American, Caucasian, Hispanic, Iranian, Mexican American, European American and Hawaiian. The reported race/ethnicities can be found on Table 1. The disability of student participants varied among the studies. Researchers focused on both students with high incidence disabilities (i.e., learning disabilities, emotional and behavioral disorder, mild intellectual disability, attention deficit-hyper activity disorder; Maggin et al., 2012; Malmgren et al., 2005) and low incidence disabilities (i.e., intellectual disability, visual impairments, cerebral palsy, autism, multiple disabilities; Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Martella et al., 1993; McCulloch & Noonan, 2013; Quilty, 2007; Robinson, 2011; Toelken & Miltenberger, 2012)

Table 2. *Paraeducator demographic information within the single-subject studies.*

Study	School	Classroom	Design
Brock & Carter (2013)	Varied	Unspecified	Randomized Controlled Trial
Causton-Theoharis & Malmgren (2005)	Elementary	Inclusive Classroom	Multiple Baseline Across Participants
Feldman & Matos (2012)	Elementary	Inclusive Classroom	Multiple Baseline Across Participants
Koegel, Kim, & Koegel (2014)	Elementary	Inclusive Classroom	MBL Across Participants
Maggin et al. (2012)	Middle	Special Education	Concurrent Multiple Baseline Across Participants
Malmgren et al. (2005)	Elementary	Inclusive Classroom	Multiple Baseline Across Participants
Martella et al. (1993)	High School	Special Education	Multiple Baseline Across Behaviors
McCulloch & Noonan (2013)	Elementary	Special Education	Multiple Baseline Across Participants
Quilty (2007)	Elementary	Various Locations	Multiple Baseline Across Participants
Robinson (2011)	Elementary	Inclusive Classroom	Multiple Baseline Across Participants
Toelken & Miltenberger (2012)	Elementary	Inclusive Classroom	Multiple Baseline Across Behaviors

Table 3. *Brock & Carter (2013 RCT study demographic information.*

Paraeducator Demographics			
Characteristic	**Experimental Group (n = 12)**	**Comparison Group (n = 13)**	**Total (n = 25)**
Gender			
Male	0	1	1
Female	12	12	24
Age			
40-49 years	6	9	15
50-59 years	5	4	9
60 years +	1	0	1
Race/Ethnicity			
Caucasian	10	12	22
Other	2	1	3
Educational Level			
High School	8	3	11
Associates	0	2	2
Bachelor's	3	7	10
Master's	1	1	2
Work Experience			
0-2 years	2	3	5
3-5 years	3	4	7
6-8 years	4	2	6
9 + years	3	4	7

Table 4. *Student demographic information within the single-subject studies.*

	Student Demographics			
Study	***Gender***	***Age/Grade***	***Race/Ethnicity***	***Disability***
Causton-Theoharis & Malmgren (2005)	M	7 yrs.	2 African American 2 Caucasian	2 Cerebral Palsy 2 Autism
	M	8 yrs.		
	M	11 yrs.		
	M	6 yrs.		
Feldman & Matos (2012)	M	8 yrs.	Mexican American	Autism
	M	5 yrs.	Caucasian	Autism
	M	5 yrs.	Chinese American	Autism
Koegel et al. (2014)	F	8 yrs.	Iranian	Autism
	M	9 yrs.	Hispanic	Autism
	M	10 yrs.	Caucasian	Autism
Maggin et al. (2012)	M	13 yrs.	Hispanic	ADHD & OHI
	M	14 yrs.	African American	EBD
	M	9 yrs.	Caucasian	EBD
	M	11 yrs.	Hispanic	EBD & LD
Malmgren et al. (2005)	M	Kdg.	-	EBD
	M	5th Grade	-	EBD
	M	3rd Grade	-	EBD
Martella et al. (1993)	M	14 yrs.	-	ID
McCulloch & Noonan (2013)	M	6 yrs.	Hawaiian	Autism
	M	10 yrs.	Hawaiian	DD
	M	8 yrs.	Hawaiian	DD
Quilty (2007)	M	6 yrs.	European American	Autism
	F	10.9 yrs.	European American	Autism
	M	10.4 yrs.	European American	Autism
Robinson (2011)	M	7 yrs.	-	Autism
	M	6 yrs.	-	Autism
	M	8 yrs.	-	Autism
Toelken & Miltenberger (2012)	M	5 yrs.	-	Autism
	M	4 yrs.	-	Autism

2.2.2 Experimental Designs

Table 1 shows each study and the design that was utilized. Among the 10 single-subject studies, six employed a concurrent multiple baseline across participants design (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; Malmgren et al., 2005; McCulloch & Noonan, 2013; Quilty, 2007; Robinson, 2011) and two employed a concurrent multiple baseline across behaviors design (Martella et al., 1993; Toelken & Miltenberger, 2012).

2.2.3 Independent Variables

The reviewed literature base provides several approaches and programs used to train paraeducators. In order to obtain a comprehensive understanding of these approaches, two elements are described: the content presented during training and the training procedures used to instruct paraeducators.

2.2.3.1 Content presented during training Of the 11 studies, six researchers focused on single strategies or interventions (Brock & Carter, 2013; Maggin et al., 2012; Martella et al., 1993; McCulloch & Noonan, 2013; Quilty, 2007; Toelken & Miltenberger, 2012), three concentrated on teaching paraeducators how to encourage socialization though student-peer interactions (Causton-Theoharis & Malmgren, 2005; Koegel et al., 2014; Malmgren, 2005) and two investigated paraeducators' use of Pivotal Response Training (PRT) packages that included several foundational behavior support strategies (Feldman & Matos, 2012; Robinson, 2011). Those researchers that focused on single strategies taught paraeducators how to perform the

skills needed to perform the strategy that was individualized to the student. For example, Quilty (2007) taught paraeducators how to write and implement a social story based on the behaviors of their students and Toelken and Miltenberger (2012) taught paraeducators a least to most prompting procedure specific to the daily living skills that their students were performing.

Table 5 shows all of the specific intervention strategies paraeducators were taught during training sessions.

Table 5. *Intervention strategies per each reviewed study.*

Study	Intervention Strategy
Brock & Carter (2013)	Constant Time Delay Procedure
Causton-Theoharis & Malmgren (2005)	Facilitating Peer Interactions
Feldman & Matos (2012)	Pivotal Response Training, Facilitating Peer Interactions
Koegel et al. (2014)	Improving Student Social Interactions
Maggin et al. (2012)	Implementing a Group Contingency Protocol
Malmgren et al. (2005)	Facilitating Peer Interactions
Martella et al. (1993)	Deliver Commands & Provide Reinforcement
McCulloch & Noonan (2013)	Mand Training
Quilty (2007)	Social Stories
Robinson (2011)	Pivotal Response Training
Toelken & Miltenberger (2012)	Brief Embedded Teaching Strategy: SWAT

2.2.3.2 Training procedures Training procedures fell into categories by those that used didactic instruction (Causton-Theoharis & Malmgren, 2005; Koegel et al., 2014; Malmgren et al., 2005; Quilty, 2007; Toelken & Miltenberger, 2012), didactic instruction with performance feedback (Brock & Carter, 2013; Feldman & Matos, 2012; Maggin et al., 2012; Martella et al., 1993),

performance feedback with modeling (Robinson, 2011), online instruction (McCulloch & Noonan, 2013), or video modeling (Brock & Carter, 2013). Didactic instruction is defined as teaching others how to do things through presentations, written communication (e.g., training manuals; Noel et al., 1997), seminars, readings, discussions (Rose & Church, 1998) or single-event workshops (Brock & Carter, 2013). Whereas performance feedback is defined as an evidence-based practice (Cornelius & Nagro, 2014) that involves a brief meeting between a consultant and a consultee following the consultant observing the consultee in the natural environment (Fallon et al., 2014). During such meetings, teacher implementation data, student performance, and graphic displays of data are shared.

Didactic instruction was provided either through one-on-one training (Causton-Theoharis & Malmgren, 2005; Martella, et al., 1993; Toelken & Miltenberger, 2012) or small-group training (Brock & Carter, 2013; Koegel et al., 2014; Maggin et al, 2012; Malmgren et al., 2005; Quilty, 2007), while one study did not identify the didactic instructional group size (Feldman & Matos, 2012). Across the studies that used didactic instruction, session durations ranged from 30 minutes (Toelken & Miltenberger, 2012) to 4 hours (Causton-Theoharis & Malmgren, 2005), with an average training duration of 2 hours and 7 minutes.

Three researchers utilized performance feedback in addition to didactic instruction as part of the training package (Brock & Carter, 2013; Feldman & Matos, 2012; Maggin et al., 2012; Martella et al., 1993), while one set of authors used performance feedback only when the paraeducator demonstrated a need for further guidance (Koegel et al., 2014). Brock and Carter (2013) provided paraeducators with one-hour in-person feedback sessions two times during the course of the study. During these performance feedback sessions the coach asked the paraeducator to demonstrate constant time delay with a student with a disability, scored the

paraeducator's fidelity of implementation of the strategy, and then showed the paraeducator a graphical display of his or her performance. In addition to providing both behavior specific praise and corrective feedback, the coach asked the paraeducator to state the steps of the constant time delay procedure and to demonstrate the strategy with the same student again. Feldman and Matos (2012) also provided in vivo performance feedback but they did so during 20-minute sessions once per school day. Performance feedback sessions included immediate positive reinforcement and corrective feedback specific to the paraeducator's use of social facilitation behaviors within PRT framework. While Feldman and Matos (2012) provided performance feedback within the training session, Maggin et al. (2012) and Martella et al. (1993) conducted brief performance feedback sessions at the conclusion of each intervention session. During this time both researchers provided verbal encouragement and corrective feedback, while Martella et al. (1993) also provided written feedback. Additionally, Maggin et al. (2012) required paraeducators to complete a five-item self-assessment on their performance during this time.

One researcher did not incorporate didactic instruction into the training process and instead used solely modeling and performance feedback. Robinson (2011) used a two-step training procedure in which training was provided to the paraeducators in the natural environment. First, specific PRT strategies were modeled with the target students while the paraeducators observed. These sessions lasted 15 minutes each, for a total 45 minutes across three sessions. Second, 15-minute performance feedback sessions were provided with each individual paraeducator upon implementing PRT strategies independent of the trainer. During the performance feedback sessions the paraeducator and trainer viewed a video of the PRT session together and incorporated the following components: (a) behavior specific praise, (b) suggestions for improving specific techniques, (c) encouragement, and (d) time dedicated for questions. The

frequency of performance feedback sessions ranged from one session to five sessions, depending on when each paraeducator obtained a procedural fidelity score of ≥80%.

Lastly, two sets of researchers examined the effect of training paraeducators using technology. First, Brock and Carter (2013) utilized video modeling in addition to two in-person coaching sessions. Video modeling was incorporated into the training package by having paraeducators watch three 15-minute videos on constant time-delay once a week for three weeks. These videos included an overview of constant time delay, the steps needed in order to execute the strategy, and an example of a researcher implementing the strategy. Paraeducators were also asked to complete a form detailing the implementation needs of each step of the constant time delay procedure. McCulloch and Noonan (2013) also used technology for training purposes, but did so using an online training program that consisted of a pre-assessment, training videos, competency assessments, a post-assessment, and a self-evaluation. Specifically, paraeducators viewed 18 videos, 2-6 minutes in duration, and completed a competency check immediately after the conclusion of each video. Paraeducators also completed a post-test in which they were required to obtain a score of 88% or they would be directed back to specific modules to review. Online training ranged from 3 hours to 8 hours, with one paraeducator needing to complete all of the modules twice.

2.2.4 Dependent Variables

2.2.4.1 Paraeducator measures Three categories of dependent variables (DV) emerged from the literature: strategies that supported social interactions, strategies that were specific to the students' individualized needs, and pivotal response training strategies. Table 6 details the specific dependent variables per each study.

Across all 11 studies researchers measured the paraeducators' response to training through intervention fidelity (Brock & Carter, 2013; Feldman & Matos, 2012; Koegel et al., 2014; McCulloch & Noonan, 2013; Quilty, 2007), specific paraeducator behavior (Causton-Theoharis & Malmgren, 2005; Malmgren et al., 2005; Martella et al., 1993; Toelken & Miltenberger, 2012), or both intervention fidelity and specific paraeducator behavior (Maggin et al., 2012; Robinson, 2011).

Seven researchers reported intervention fidelity as a means to measure the paraeducators' response to training. Authors measured intervention fidelity within each session by the number of correct and incorrect paraeducator behaviors (Koegel et al., 2014; Feldman & Matos, 2012; McCulloch & Noonan 2013; Robinson, 2011), adherence to a specific implementation plan (Quilty, 2007) or by the number of completed steps on a checklist (Brock & Carter, 2013; Maggin et al., 2012). Most authors used a partial interval data collection procedure during which behaviors were coded as correct or incorrect (Koegel et al., 2014; Feldman & Matos, 2012; McCulloch & Noonan, 2013; Robinson, 2011) while several sets of authors recorded all occurrences of the behavior during each interval (Causton-Theoharis & Malmgren, 2005; Malmgren et al., 2005) and one author used a frequency count converted into a percentage (Martella et al., 1993). Those authors that evaluated the number of completed steps per a pre-

determined checklist reported the results using a percent of steps completed correctly (Brock & Carter, 2013; Maggin et al., 2012).

Six sets of authors measured specific paraeducator behaviors' that were either targeted to increase (Causton-Theoharis & Malmgren, 2005; Maggin et al., 2012; Malmgren et al., 2005; Martella et al., 1993; Robinson, 2011), or decrease (Martella et al., 1993; Robinson, 2011; Toelken & Miltenberger, 2012). In order to measure the specific paraeducator behaviors authors used a frequency count within pre-determined intervals (Causton-Theoharis & Malmgren, 2005; Malmgren et al., 2005), partial interval recording (Maggin et al., 2012; Robinson, 2011), momentary time sampling (Malmgren et al., 2005), or a total session frequency count (Martella et al., 1993; Toelken & Miltenberger, 2012).

2.2.4.2 Student measures Of the 11 studies, 10 had student measures that were specific to the needs of each student. The behavioral and adaptive skills addressed across the 10 studies included problem behavior (Maggin et al., 2012; Martella et al., 1993; Quilty, 2007; Toelken & Miltenberger, 2012), communicative skills (McCulloch & Noonan, 2013), and social skills (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Malmgren et al., 2005; Robinson, 2011). Specifically, authors either sought to increase student interactions (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Malmgren et al., 2005) spontaneous mands (McCulloch & Noonan, 2013), student affect (Robinson, 2011), and independence level (Toelken & Miltenberger, 2012), or they sought to decrease aggression (Maggin et al., 2012; Martella et al., 1993) or other problem behavior (Quilty, 2007). One study did not include student measures (Brock & Carter, 2013), but, rather focused specifically on the effects of two training packages on paraeducator performance.

In order to measure student performance, the authors used partial interval recording (Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; McCulloch & Noonan, 2013), calculated rate (Causton-Theoharis & Malmgren, 2005; Koegel et al., 2014), frequency count within pre-determined intervals (Malmgren et al., 2005; Robinson, 2011; Toelken & Miltenberger, 2012), and a total session frequency count (Martella et al., 1993; Quilty, 2007).

Table 6. *Dependent variables per each study.*

Study	Paraeducator DV	Student DV
	Social Interactions	
Causton-Theoharis & Malmgren (2005)	Facilitative behaviors	Student interactions
Koegel et al. (2014)	Proximity, cooperative arrangements, child preferred interests	Student engagement with typical peers
Malmgren et al. (2005)	Proximity, facilitative behaviors	Student interactions
	Individualized Strategies	
Brock & Carter (2013)	Time delay procedure	No student DV
Maggin et al. (2009)	Steps of a group contingency protocol, verbal interactions	Aggression
Martella et al. (1993)	Giving commands, specific praise statements, negative statements	Negative verbalization, foot stomping, compliance
McCulloch & Noonan (2013) Quilty (2007)	Mand training procedure Social stories	Spontaneous mands Repeated phrases, earn breaks, and inappropriate behavior
Toelken & Miltenberger (2012)	Level of prompting	Lunchtime routine and backpack routine
	PRT	
Feldman & Matos (2012)	Level of involvement, hovering, noninvolvement, social facilitation, monitoring	Reciprocal social engagement
Robinson (2011)	Child choice, shared control, clear opportunities, reinforcement, communication, proximity, level of involvement	Social-communicative behaviors, affect

2.2.5 Outcome Measures

2.2.5.1 Paraeducator outcomes The researchers that measured intervention fidelity during the intervention phases reported positive outcomes with a mean score of 81%, ranging from 59% to 100%. Additionally, all of the researchers that measured specific paraeducator behavior reported

an immediate improvement upon completion of the training program. Five investigators reported that paraeducators maintained a similar level of performance during follow-up observations (Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; Martella et al., 1993; Quilty, 2007; Robinson, 2011; Toelken & Miltenberger, 2012), two reported a decrease in performance from intervention to follow-up (Causton-Theoharis & Malmgren, 2005; McCulloch & Noonan, 2013), and one author did not report follow-up data (Malmgren et al., 2005).

Brock and Carter (2013) found that those participants that received coaching in addition to the stand-alone workshop had significantly more improvement with intervention fidelity. Additionally, they found that those participants who received the abbreviated coaching alone had significant improvement post-coaching. Further results also revealed no statistically significant differences between those participants who received video modeling and coaching and those participants who received coaching alone.

2.2.5.2 Student outcomes Authors of the 10 studies that measured student behavior also reported that students experienced positive results as a product of paraeducator training. Student participants in each of the studies demonstrated an immediate improvement in their target behavior during the intervention phase (i.e., the period of time paraeducators were being provided training or the period of time immediately following paraeducator training). The level of performance varied within the follow-up phase among 29 student participants. Maintenance probe data revealed that 59% (n = 17) of students maintained their level of performance (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Maggin et al., 2012; McCulloch & Noonan, 2013; Quilty, 2007; Toelken & Miltenberger, 2012), 7% (n = 2) improved their level of performance (Quilty, 2007; Robinson, 2011), 21% (n = 6) displayed a

decrease in performance from intervention to maintenance, (Martella et al., 1993; Quilty. 2007; Robinson, 2011), and 12% (n = 3) did not have follow-up data recorded (Malmgren et al., 2005).

2.2.6 Interobserver Agreement (IOA)

All 11 sets of authors in this review included an IOA measurement to check the reliability of data collection. IOA was collected on 18% to 100% of sessions across participants. Further, IOA outcomes ranged from 83% to 100% across the dependent measures within all 11 studies.

2.2.7 Implementation Fidelity

Across the 11 studies, four authors included an implementation fidelity measure that evaluated the training given to the paraeducator by the researcher (Brock & Carter, 2013; Causton-Theoharis & Malmgren, 2005; Maggin et al., 2012; Malmgren et al., 2005). Two sets of authors assessed procedural integrity by audio recording all of the training sessions and having an independent rater listen and score the recorded sessions. Both reported that 100% of the training components were used during each training session (Causton-Theoharis & Malmgren, 2005; Malmgren et al., 2005). Similarly, Maggin et al. (2012) had an independent observer evaluate the fidelity of the researcher following the performance feedback protocol on 43% of the training sessions. The independent observer completed the observations in vivo and determined that the 100% of the training components were delivered during each performance feedback session. Brock and Carter (2013) implemented an online self-report system for those participants completing the video-modeling portion of the study. Of those 12 participants seven watched all three videos, three watched two videos, and one watched one video. In order to assess treatment

fidelity during coaching sessions a second observer coded the trainer's behavior using a checklist of procedures, resulting in a score of 99.6%.

2.2.8 Social Validity

Of the 11 studies included in this review, five included some form of a social validity measure (Brock & Carter, 2013; Koegel et al., 2014; Feldman & Matos, 2012; Maggin et al., 2012; Robinson, 2011). Three sets of authors (Brock & Carter, 2013; Feldman and Matos, 2012; Koegel et al., 2014) measured the social validity of the training package alone while Maggin and colleagues (2012) measured the social validity of the paraeducator-delivered intervention alone. Robinson (2011) was the only author to assess the social validity of both the paraeducator training program and the student response to the intervention. Results of all five social validity measures yielded positive outcomes. Paraeducators found training to be positive, with specific interest in performance feedback (Brock & Carter, 2013; Feldman & Matos, 2012), while teachers and paraeducators found the chosen intervention to be fair, feasible, and effective (Maggin et al., 2012). Robinson's (2011) social validity measure found that paraeducators felt better prepared to support their students and that student affect (e.g., negative, neutral or positive) either maintained or improved post-paraeducator training. Similarly, Koegel and colleagues (2014) found that paraeducators found the training workshops to be helpful.

2.3 METHODOLOGICAL QUALITY OF RESULTING STUDIES

2.3.1 Single-Subject Design Studies

Horner et al., (2005) delineated quality indicators for the implementation of single subject research. Five years later, in 2010, the What Works Clearinghouse (WWC) assembled a panel of experts on single-case designs (Kratochwill et al., 2010) to essentially build on those quality indicators with leveled standards for single-subject research. The WWC Single-Case Design Technical Documentation sets strict standards for single-subject research and classifies studies within the levels of *Meets Standards, Meets Standards with Reservations,* or *Does not Meet Standards* (Kratochwill, 2010). Both the quality indicators and the single-subject design standards were used to examine the methodological quality of the 10 single-subject studies in this review. Table 7 highlights which standards each of the 10 single-subject studies met.

2.3.1.1 Participants and settings It is important to ensure that both the participants and the setting are described with sufficient precision in order to warrant other researchers the opportunity for replication. Not only should authors describe participant characteristics clearly, but they should also report the process or criteria used to select participants (Horner et al., 2005).

Most of the authors provided sufficient demographic descriptions of both the paraeducator and student participants. However, several authors omitted the race/ethnicity of students (Malmgren et al. 2012), or of both students and paraeducators (Martella et al., 1993; Robinson, 2011; Toelken and Miltenberger, 2012). Additionally, Causton-Theoharis and Malmgren (2005), Koegel and colleagues (2014), and Quilty (2007) neglected to report the age

of the paraeducators serving as participants. Although the demographic information appears to be reported with sufficient detail, only three sets of authors (Feldman & Matos, 2012; Koegel et al., 2014; Robinson, 2011) reported the inclusion criteria used to determine which individuals would be included in the study for both paraeducator and student participants. Malmgren et al. (2005) and Quilty (2007) described specific inclusion criteria used for students, but not paraeducators, while five authors did not detail any information regarding criteria used to assess possible participants (Causton-Theoharis & Malmgren, 2005; Maggin et al., 2012; Martella et al., 1993; McCulloch & Noonan, 2013; Toelken & Miltenberger, 2012). Although Maggin et al. (2012) did not share the specific inclusion criteria used, the process for recruiting study participants was described in detail. Therefore, of the 11 reviewed studies, only one study (Feldman & Matos, 2012) included all of components required to meet the quality indicator with another study meeting all of the standards with the exception of reporting paraeducator age (Koegel et al., 2014).

2.3.1.2 Designs Within single-case design research there are a variety of design options depending on the goal of the identified research questions. However, all single-case designs must employ a repeated, systematic measurement of a dependent variable (DV) before, during, and after the manipulation of an (independent variable) IV. This process is mandatory in order to determine if a functional relationship exists between the DV and IV. Further, the effects of the IV on the DV must be measured recurrently within and across the different phases or levels of the IV (Kratochwill et al., 2010).

All 10 sets of researchers employed some form of a multiple baseline design, with a minimum of three comparisons from within and across participants or behaviors in order to assess the effects of training on paraeducator behavior and student response to the targeted

intervention. All of the studies, except three (Koegel et al., 2014; Malmgren et al., 2012; Quilty, 2007), measured and graphically displayed the performance of both paraeducators and students. Although they systematically measured the performance of the students in relation to the IV, Koegel and colleagues (2014), Malmgren and colleagues (2012), and Quilty (2007) they relied solely on calculated means of pre and post assessment data. Specifically, Koegel and colleagues (2014) and Quilty (2007) calculated the mean fidelity of paraeducator performance for baseline, intervention, and maintenance phases, while Malmgren and colleagues (2012) calculated the overall mean fidelity of paraeducator performance during baseline and the post-intervention phase. Therefore, none of these articles included a graphical representation of paraeducator performance that could be used for visual analysis and interpretation. Of the 10 single-subject studies, seven studies (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Maggin et al., 2012; Martella et al., 1993; McCulloch & Noonan, 2013; Robinson, 2011; Toelken & Miltenberger, 2012) met the requirements for a quality study in relation to the research design.

2.3.1.3 Baseline In order to predict the pattern of future performance without interference, the baseline data within a single-subject study must demonstrate repeated measurement of a DV and establish a stable pattern of responding (Kratochwill et al., 2010; Horner et al., 2005). In order to qualify a pattern of responding as stable, the baseline condition must contain a minimum five data points for a strong effect or three data points for an effect with reservations (Cooper, Heron, & Heward, 2007; Kennedy, 2005; Kratochwill et al., 2010). Further, the parameters of the baseline condition should be described with replicable accuracy (Horner et al., 2005).

Across all of the paraeducator graphs, only three studies met the minimum baseline data standard for all baseline conditions (Causton-Theoharis & Malmgren, 2005; Maggin et al., 2012; Martella et al., 1993), while three studies met the baseline standard with reservations (i.e.,

minimum of three baseline data points; Feldman & Matos, 2012; McCulloch & Noonan, 2013, Toelken & Miltenberger, 2012) and one study (Robinson, 2011) did not meet the standard as one baseline condition only had two data points. The remaining three studies (Koegel et al., 2014; Malmgren et al., 2005; Quilty, 2007) also did not meet the baseline standard due to neglecting to include graphical representations of paraeducator performance. Of the three studies that met the standard, two studies contained baselines that had stable patterns of responding (Causton-Theoharis & Malmgren, 2005; Maggin et al., 2012), while one study (Martella et al., 1993) had a decreasing baseline trend for a behavior targeted for reduction through intervention. This decreasing trend makes it difficult to determine the true effectiveness of the IV as the paraeducator behavior was already improving prior to the implementation of the training. Therefore, the true effect of the IV on the DV is unclear. Of the three studies that met the standard with reservations, both Feldman and Matos (2012) and Toelken and Miltenberger (2012) had baseline conditions with stable responding, while McCulloch and Noonan (2013) had two baseline conditions with variable data and another with a decreasing trend for percentage of fidelity. Because these three studies have one or more baseline conditions that only meet the baseline data standard with reservations, the effects of the IV on the DV should be interpreted with caution.

Six studies met the minimum baseline data standard for all baseline conditions (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012, Malmgren et al., 2005; Martella et al., 1993; Quilty, 2007; Toelken and Miltenberger, 2012), while three met the standard with reservations (Koegel et al., 2014; Maggin et al., 2012; McCulloch & Noonan, 2013) and one did not meet the standard (Robinson, 2011). Of those studies that met the standard, only Feldman and Matos (2012) and Toelken and Miltenberger (2012) had stable patterns of responding across

all student participants. All of the other studies had either one or more baseline conditions with variable data (Causton-Theoharis & Malmgren, 2005, Malmgren et al., 2005; Quilty, 2007) or had baseline trend lines that made the effect of the IV questionable (Martella et al.,1993; Quilty, 2007). One study that met the standard with reservations had two baseline conditions that contained variable data and two that contained a decreasing trend line for behaviors targeted to decrease with intervention (Maggin et al., 2012). Another study that met the standard with reservations had two baseline conditions with variable data, with only three data points, and one with somewhat stable data (McCulloch & Noonan, 2013). The third study that met the standard with reservations had three baselines with stable responding (Koegel et al., 2014).

Overall none of the included studies met the quality criteria for all baselines for both paraeducators and students, while seven studies met the standard with reservations (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; Martella et al., 1993; McCulloch & Noonan, 2013; Toelken & Miltenberger, 2012). Those studies that either met the standard with reservations or did not meet the minimal baseline data standard (Quilty, 2007; Robinson, 2011) yielded results that should be interpreted carefully. Further, those studies that also have variable data, or baseline trends that counteract the effects of the IV on DV, should also be considered with caution as the true outcome effects may not be as promising as initially thought.

2.3.1.4 Dependent variables Within single-subject research each DV must be described to the degree at which another investigator can replicate it and it must be measured in a quantifiable manner. In addition to being measured recurrently over time, IOA or reliability data must be collected on each DV (Horner et al., 2005). Further, IOA data must be measured in each

condition of the study with at least 20% of sessions across all phases assessed (Kratochwill et al., 2010) and have a minimum agreement of 80% (Hartmann et al., 2004).

With the exception of three studies (Cautson-Theoharis & Malmgren, 2005; Maggin et al., 2012; Malmgren et al., 2005), all of the single-subject studies included in this review met the standards set for DVs within single-subject research. Both Cautson-Theoharis and Malmgren (2005) and Malmgren and colleagues (2005) described the DV with sufficient and replicable detail, collected IOA, and had a minimum of 80% agreement, but they did not collect data on a minimum of 20% of sessions. Also, all of the authors specified that IOA data was collected across all conditions within the study, except for Maggin et al. (2012). Therefore, it is unclear as to whether or not Maggin and colleagues (2012) collected IOA data across all conditions or not.

It is also important to note that although three sets of authors reported using quality data collection measures, they reported their findings as average scores of performance and did not include graphical representations of paraeducator performance (Koegel et al., 2014; Malmgren et al., 2005; Quilty, 2007). Therefore it is unclear how the paraeducators' performed recurrently overtime.

2.3.1.5 Independent variables Not only is it important to operationally define the IV with sufficient precision, but it is equally important to measure the fidelity of its implementation (Horner et al., 2005). Further, researchers must establish criteria as to when and how the IV condition should change and then systematically manipulate the IV per these conditions (Kratochwill et al., 2010). Additionally an assessment of the intervention's treatment fidelity (Gresham, 1997; Hagermoser Sannetti & Kratochwill, 2005) is needed in order to determine whether the actual intervention was implemented as intended throughout the duration of the

study. Ensuring that the participants receive the intervention as intended increases the validity of the observed effects (Kratochwill, 2010).

Authors of the included studies either described the IV with sufficient detail (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; Malmgren et al., 2005; McCulloch & Noonan, 2013; Quilty, 2007; Robinson, 2011) or moderate detail (Martella et al., 1993; Toelken & Miltenberger, 2012), but many overlooked the importance of including a training fidelity measure. Only three authors included a fidelity measure for the training provided to the paraeducators (Causton-Theoharis & Malmgren, 2005; Maggin et al., 2012; Malmgren et al., 2005) and all three studies yielded a fidelity of training score of 100%. Both Causton-Theoharis and Malmgren (2005) and Malmgren and colleagues (2005) audio recorded training sessions to ensure all components of the training were implemented, while Maggin and colleagues (2012) had an independent observer collect data on the researcher's adherence to a specific training protocol during each training session. Therefore, for 70% of the studies, the quality of training given to paraeducators is unknown, making it difficult to disaggregate the true effects training had on paraeducator performance (Feldman & Matos, 2013; Koegel et al., 2014; Martella, et al., 1993; McCulloch & Noon, 2013; Quilty, 2007; Robinson, 2011; Toelken & Miltenberger, 2012). Further, only four studies (Feldman & Matos, 2012; Koegel et al., 2014; McCulloch & Noonan, 2013; Robinson, 2011) reported the use of specific criteria to determine when training should conclude and the post-intervention phase should begin. Feldman and Matos (2012), Koegel and colleagues (2014), and Robinson (2011) required paraeducators to receive a specific fidelity of implementation score for several consecutive probes in order to conclude the training, while McCulloach & Noonan (2013) required paraeducators to earn a score of 88% on a summative assessment specific to concepts

presented during the online training program. Therefore, 60% of the studies did not include a training criterion for paraeducators in order to show that the training concepts and skills were understood and processed correctly. Although some studies included a measurement of fidelity during the post-intervention condition, the lack of a training criterion left it unclear as to whether or not the paraeducators fully learned the material before moving into the post-intervention phase. Lastly, half of the studies included specific criteria for when to change conditions (Feldman & Matos, 2012; Maggin et al., 2012; Malmgren et al., 2005; Martella et al., 1993; McCulloch & Noonan, 2013), with most of the authors reporting the use of stable responding (Feldman & Matos, 2012; Malmgren et al., 2005; McCulloch & Noonan, 2013) as the determination for condition changes. Only two authors set specific criteria for condition changes. Maggin and colleagues (2012) changed conditions based on the student's aggression level and the paraeducator's correct implementation of at least 80% of the intervention protocol. Because Martella and colleagues (1993) employed a MBL across behaviors, specific performance criteria were set for each behavior that had to be met before the next behavior was introduced. For example, the paraeducator had to use appropriate commands for 80% of the opportunities over three consecutive trials before the praise statements phase began. The remaining five studies did not include any information on established criteria, or the theory relied on, to change (Causton-Theoharis & Malmgren, 2005; Koegel et al., 2014; Quilty, 2007; Robinson, 2011; Toelken & Miltenberger, 2012).

Therefore, none of the studies included all of the components needed to meet the quality standards for the IV. However, two studies did meet four out of five of the key quality requirements (Maggin et al., 2012; Malmgren et al., 2005) and several studies met three out of five (Feldman & Matos, 2012; McCulloch & Noonan, 2013).

2.3.1.6 Experimental control/internal validity In order to demonstrate experimental control a single-subject study must contain minimum of three intervention effects at three different points within the design (Horner et al., 2005). Similar to baseline standards, in order to qualify as a strong effect, the phases within a multiple baseline design must contain at least five data points. A demonstrated effect containing only three data points per phase is allowable, but is considered a moderate effect with reservations (Kratochwill et al., 2010). Additionally, the level, trend, and variability of the data within each phase must be evaluated in order to determine if a relation between the IV and DV exists (Kratochwill et al., 2010).

Of the 10 single-subject studies included in this review, three did not have a minimum of five data points within all of the intervention conditions (Feldman & Matos, 2012; Maggin et al., 2012; Robinson, 2011) and three did not include graphical representations of paraeducator performance (Koegel et al., 2014; Malmgren et al., 2005; Quilty, 2007), making it difficult to assess the effects of the IV on the DV. However, all 10 single-subject studies did demonstrate experimental control with a minimum of three validated effects at three different points within each design. Several participants had variable data (McCulloch & Noonan, 2013; Malmgren et al., 2005; Quilty, 2007), but changes in the level from baseline to intervention served to highlight the presence of an effect. Several studies showed only slight changes in level (Koegel et al., 2014; McCulloch & Noonan, 2013; Malmgren et al., 2005), whereas other studies showed moderate to substantial shifts in level (Causton-Theoharis & Malmgren, 2005; Felman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; Martella et al., 1993; Quilty, 2007; Robinson, 2011; Toelken & Miltenberger, 2012). Although trend lines appeared to be supportive of intervention effects across most studies, both Causton-Theoharis and Malmgren (2005) and Koegel and colleagues (2014) had one participant with an immediate and positive response to

intervention quickly followed by a descending trend line for a behavior targeted to increase. Further, not only did both Koegel and colleagues (2014) and McCulloch and Noonan (2013) find conservative changes in the level from baseline to intervention but McCulloch and Noon (2013) had one student participant with 67% of overlapping data.

Analysis of the maintenance conditions across all 10 single-subject studies revealed that only two studies met the standard with a minimum of five data points (Maggin et al., 2012; Martella et al., 1993) and one study met the standard with reservations (Toelken & Miltenberger, 2012). The remaining studies either contained fewer than three data points (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; McCulloch & Noonan, 2013; Quilty, 2007; Robinson, 2011) or did not contain follow-up data at all (Malmgren et al., 2005). Maggin and colleagues (2012) found that all of the paraeducators maintained a similar level of performance during follow-up as they did during intervention, but two of the three follow-up trend lines projected regression of performance. However three of the four students had performance during the maintenance condition with similar trend lines to intervention and stable responding. One student's data was not clearly indicated on the graph; therefore follow-up performance on the remaining student is unknown. Martella and colleagues (1993) found similar results with their student participant responding consistently across all three behaviors during follow-up and at a level similar to intervention. Further, trend lines revealed one of the behaviors was actually projected to improve beyond the level reported during intervention. The paraeducator's performance during the maintenance condition appeared to be inconsistent across the three behaviors. The level of one behavior was slightly below the level found during intervention, but higher than baseline, the level of another behavior was higher than intervention, and the level of the third behavior was the same as during intervention. Trend lines revealed that

the first two behaviors were stable, while the third behavior was projected to continue to improve over time. Although Toelken and Miltenberger (2012) only had four follow-up data points, and therefore met the standard with reservations, they found similar levels during intervention and follow-up across all six behaviors. Further, five of the behaviors had stable responding and all six behaviors had supportive trend lines. The remaining studies that reported two or less follow-up probes (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Malmgren et al., 2005; McCulloch & Noonan, 2013; Quilty, 2007; Robinson, 2011) did not meet the quality standards and were also unable to predict the trajectory of continued performance. Although most of these follow-up probes fell within the same level as the intervention, suggesting positive effects, the lack of a sufficient amount of maintenance data leaves the level, trend, and variability unable to be visually interpreted.

2.3.1.7 External validity One way to validate external validity is to measure the extent of generalization of skills. Generalization can be demonstrated by replicating the experimental effects across other individuals, environments, or materials (Horner et al., 2005). Across the 10 single-subject studies analyzed in this review, only two sets of authors included a generalization condition within the design of the study (Feldman & Matos, 2012; Robinson, 2011). Feldman and Matos (2012) reported that paraeducators successfully generalized the targeted skills to a new activity for three consecutive days, while Robinson (2011) reported that paraeducators successfully generalized the new acquired skills to both a new activity as well as different students with disabilities.

2.3.1.8 Social validity It is important to evaluate the level of change in the DV in relation to the practicality and cost effectiveness of the IV, and whether or not the result is socially important to

the study participants and associated stakeholders (Horner et al., 2005). As described earlier, only four studies included a social validity measure (Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; Robinson, 2011) and only one of those three studies measured the social validity of both the paraeducator training and the student intervention (Robinson, 2011). Therefore, not only did 70% of the studies included in this review not meet the social validity standards set forth by Horner and colleagues (2005), but more importantly, the social importance and acceptance of the training packages and interventions employed in these studies is unknown.

2.3.2 Group Design Study

Similar to the quality indicators set forth by Horner and colleagues (2005) and the standards established by Kratochwill and colleagues (2010), Gersten and colleagues (2005) developed quality indicators for group experimental design studies. These indicators serve to both guide the development and execution of high quality research as well as aide in the evaluation of completed research. Similar to the work of Horner and colleagues (2005), Gersten and colleagues (2005) categorized the essential areas of group design research into several domains. These domains include: description of participants, implementation of the intervention and description of the comparison conditions, outcome measures, and data analysis. Further, Gerston and colleagues (2005) also included an additional eight desirable quality indicators in order to distinguish studies that were "acceptable" from those that are considered "high" quality. In order to be considered of "acceptable" quality a study must meet all but one of the essential quality indicators and demonstrate a minimum of one of the desirable indicators. Similarly, in order to be classified as a "high" quality study all but one of the essential quality indicators and demonstrate a minimum of four of the desirable quality indicators (Gerston et al., 2005).In order

to determine the level of merit of the group design study completed by Brock and Carter (2013) the study was evaluated using the quality standards set forth by Gerston and colleagues (2005).

2.3.2.1 Description of participants In order to demonstrate that the sample of participants represent the disabilities included in the study, the author must use a sampling procedure that ensures that the included participants exhibit the difficulties or disabilities of interest, and therefore represent the targeted population as a whole. Further, appropriate procedures must be used in order to ensure the characteristics of participants, interventionists, and teachers are similar across conditions (Gerston et al., 2005). Brock and Carter's (2013) sampling procedure consisted of sending a mass e-mail to all paraeducators in one public school district. Paraeducators were screened to ensure they met inclusion criteria and 29 participants ultimately participated in the study. The authors also do provide sufficient information regarding the paraeducator participants included in the study, however, information regarding the students they support was limited. Although the students did not serve as study participants, they did serve an important role, as the focus of the study was for paraeducators to implement evidence-based practices with students who receive special education services. Brock and Carter (2013) did report that the paraeducators in both the experimental and comparison groups did not differ significantly, aside from higher levels of education in the comparison group. However, the authors did not include any information regarding the similarities and differences among the students the paraeducators supported. It is unclear as to whether or not the students' level of disability, and other attributes, could have affected the paraeducators' use of the constant time delay strategy.

2.3.2.2 Implementation of the intervention and description of the comparison conditions When reporting the methods of a group design study authors must make sure to describe the intervention and the nature of the comparison conditions clearly. Additionally, authors must assess the fidelity of implementation of the intervention and describe both the measurement process used and derived results (Gerston, 2005). Brock and Carter (2013) describe both the experimental group and comparison group clearly and ensured that random assignment was incorporated into the design. Further, the intervention process is explained and details are given regarding the steps researchers followed for a variety of scenarios. Fidelity of implementation data was collected in both groups and the instrument and process used to collect the data was described. Fidelity of implementation results were reported clearly in the results section of the manuscript using a table.

2.3.2.3 Outcome measures When evaluating the outcomes multiple measures must be used in order to asses both the intervention effects and generalization. Not only must multiple measures be utilized, but authors must also ensure that the intervention's effect is measured at the appropriate times as each study may have critical time periods in which intervention effects can be best captured. Further, evidence of reliability and validity must be provided and detailed thoroughly (Gerston, 2005).

2.3.2.4 Data analysis It is important for the data analysis techniques to be appropriately linked to the research questions set forth by the authors. Within these data analysis techniques authors must make sure that variability is accounted for through both sampling strategies and statistical techniques. Lastly, in order to support the assumption that a statistical test will accurately represent a statistical significance a power analysis should be conducted for each unit of analysis

(Gerston, 2005). As mentioned earlier, Brock and Carter (2013) employed a sampling procedure by sending mass e-mail to all paraeducators in one public school district. The authors also described the data analysis techniques used to answer the research questions the study sought to answer (e.g., one-way ANOVA, ordinary least squares, paired-samples *t* test), The authors also supported their decisions on which statistical analyses they used with thorough explanations In addition to the sampling procedure, variability was accounted for through the randomization of the control and experimental groups, as well as through several Analysis of Variance (ANOVA) assessments. Effect sizes were measured using Cohen's *d* and the guidelines lines proposed by Cohen (1988). However, the authors did not specify if a power analysis was completed.

2.3.2.5 Desirable quality indicators Gerston and colleagues (2005) provide eight additional guiding questions for researchers to consider when designing and implementing group design research. The more standards met, the higher the quality of the study. Gerston and colleagues (2005) desirable quality indicators are outlined in Table 8. Brock and Carter (2013) met two of the additional desirable indicators as the nature of the instruction provided in the comparison group was detailed sufficiently and the results were presented in a clear and comprehensible manner.

2.3.3 Conclusion

In summary, none of the single-subject studies included in this review met all eight of the quality indicators and standards set forth by Horner and colleagues (2005) and Kratochwill and colleagues (2010). Feldman and Matos (2012) completed the highest quality study with 88%

(n=8) of the nine standards either met or met with reservations. Maggin and colleagues (2012) employed the second strongest study with 78% of the standards met or met with reservations.

Martella et al. (1993), Robinson (2011), and Toelken and Miltenberger (2012) executed the third strongest studies with 66% (n=6) of the standards met or met with reservations. The remaining studies (Koegel et al., 2014; Malmgren et al., 2005; McCulloch & Noonan, 2013; Quilty, 2007) met 55% (n=5) or less of the quality standards, with or without reservations.

The RCT study completed by Brock and Cater (2013) met most of the quality indicators set forth by Gerston and colleagues (2005) with the exception of neglecting to include student information. Meeting most of the quality standards and also meeting two of the additional desirable quality indicators, Brock and Carter's (2013) RCT study qualifies as an acceptable quality study.

Table 7. *Number of single-subject studies that met each quality indicator.*

Quality Indicators

❒Met the Standard
●Met the Standard with Reservations
☒ Did Not Meet the Standard

	Partic. & Setting	*Design*	*Baseline* *Para/Student*	*DV*	*IV*	*Internal Validity* Intv/Main	*External Validity*	*Social Validity*
Causton-Theoharis & Malmgren (2005)	●	❒	●/●	●	●	●/☒	☒	☒
Feldman & Matos (2012)	❒	❒	●/❒	❒	●	●/☒	❒	●
Koegel et al. (2014)	❒	●	☒/●	❒	●	●/☒	☒	●
Maggin et al. (2012)	●	❒	●/●	●	●	●	☒	●
Malmgren et al. (2005)	●	●	☒/●	●	●	●/☒	☒	☒
Martella et al. (1993)	●	❒	❒/●	❒	●	❒	☒	☒
McCulloch & Noonan (2013)	●	❒	●/●	❒	●	●/☒	☒	☒
Quilty (2007)	●	●	☒/●	❒	●	●/☒	☒	☒
Robinson (2011)	●	❒	☒/☒	❒	●	●/☒	❒	❒
Toelken & Miltenberger (2012)	●	❒	●/❒	❒	●	●	☒	☒

Table 8. *Gerston et al. (2005) Desirable Quality Indicators*

1. Was data available on attrition rates among intervention samples? Was severe overall attrition documented? If so, is attrition comparable across samples? Is overall attrition less than 30%?
2. Did the study provide not only internal consistency reliability, but also test-retest reliability and inter-rater reliability (when appropriate) for outcome measures? Were data collectors and/or scorers blind to study conditions and equally (un)familiar to examines across study conditions?
3. Were outcomes for capturing the intervention's effect measured beyond an immediate posttest?
4. Was evidence of the criterion-related validity and construct validity of the measures provided?
5. Did the research team assess not only surface features of fidelity implementation, but also examine quality of implementation?
6. Was any documentation of the nature of instruction or series provided in comparison conditions?
7. Did the research report include actual audio or videotape excerpts that capture the nature of the intervention?
8. Were results presented in a clear, coherent fashion?

2.4 DISCUSSION

The role of paraeducators has dramatically evolved and expanded over the last decade. However, paraeducator training is often unavailable or limited in content (Hall et al., 2010). Therefore, the purpose of this review was to investigate current paraeducator training practices and the effects it has on both paraeducator behavior and student outcomes. Specifically, this review aimed to identify the characteristics of the individuals who received paraeducator training, the content presented during training, the approaches used to train paraeducators, and the overall effectiveness of paraeducator training on paraeducator behavior and student outcomes.

In terms of the first research question for this review, who is participating in paraeducator training, the studies included in this review revealed that the paraeducators supporting students

with disabilities in the school setting represent a diverse group of individuals. Among the 11 studies included in this review five ethnicities were represented across an age-range spanning 41 years. Additionally, the highest level of educational attainment varied among the sample of paraeducators, however slightly under half reported having a high school diploma (i.e., 46% single-subject, 44% RCT). The current literature base does not reveal the specific barriers these differences place on effective paraeducator training; however, school leaders are left considering these differences when planning paraeducator training programs.

This review also shed some light on the type of content currently presented during paraeducator training sessions. Seven of the studies focused on one targeted intervention strategy specific to the needs of the student participants, whereas only three (Feldman & Matos, 2012; Koegel et al., 2014; Robinson 2011) focused on more universal and foundational behavior management strategies.

Although teaching paraeducators isolated intervention strategies is important, focusing on a range of fundamental behavioral theories and skill sets (e.g., providing choice, use of reinforcement, etc.) may produce lasting effects for both paraeducators and students with disabilities. Using fundamental strategies based on the principles of applied behavior analysis has been shown to be effective for addressing the deficits associated with students with autism (Lerman, Vorndran, Addison, & Kuhn, 2004) and may yield similar effects for students with other disabilities. Not only could paraeducators use these broader skillsets alongside specific interventions, they may be better able to generalize these skills across a variety of settings and students.

The modes of training represented across the 11 studies included didactic instruction, didactic instruction plus performance feedback, performance feedback and modeling, or an

online program to train paraeducators. Due to inconsistent reporting, different intervention strategies targeted, and varied quality of the studies the current literature base on paraeducator training does not clearly reveal which training approach is most effective. However, 45% of the studies included in this review used solely didactic instruction to provide training for paraeducators. This is consistent with Brock and Carter's (2013) earlier findings that paraeducator training is most often conducted through single-event workshops (e.g., school in-service days). However, Barnes, Dunning, and Rehfeldt (2011) found this presentation-style approach to be minimally effective on the behavior of paraeducators who work with adults with autism. There is also a growing body of teacher training literature that suggests that didactic training alone is not effective enough to maintain newly acquired skills (Hans & Weiss, 2005; Noell, Witt, Gilbertson, Ranier & Freelan, 1997; Riley-Tillman & Eckert, 2001). Robinson (2007) did not use didactic instruction and found similar positive effects in a short amount of time (i.e., 45 minutes modeling session and 15-minute performance feedback sessions) using solely modeling and performance feedback. Further, an evaluation completed by the What Works Clearninghouse standards for single-case design research (Kratochwill et al., 2010) and a systematic review of performance feedback by Fallon et al. (2015) revealed that this type of intervention is an evidence-based practice and is supported with strong to moderate evidence. Therefore performance feedback should be considered when creating a paraeducator training program.

All of the five researchers that incorporated performance feedback into the training program (Brock & Carter, 2013; Feldman & Matos, 2012; Maggin et al., 2012; Martella et al., 1993; Robinson, 2011) did so by employing individualized and one-on-one verbal and/or written feedback. With paraeducators working cooperatively with other paraeducators and special

education service providers (Pellecchia et al., 2011) delivering performance feedback within a group format may have further benefits. Moreover, with packed and overwhelmed schedules of staff in special education (Carroll, 2001) and with paraeducator training often overlooked (Giangreco et al., 2001) providing group performance feedback may make the practice more feasible and time-friendly.

Lastly, although all authors reported positive outcomes it is important to consider the quality of each study. All of the authors who completed single-subject studies included important research components within each of the studies, but none of the studies met all of the quality indicators for all participants and/or targeted behaviors. The lack of specific information and the low quality of some aspects of the studies make it difficult to draw strong conclusions about the experimental control of the IV on the DV, as well as the overall effectiveness of the trainings and interventions. Despite the reported positive outcomes, the methodological issues that appear across all ten studies not only make replication challenging, but also makes it difficult to conclude which training approaches are most effective. This review draws attention to these methodological issues and serves to provide guidance for single-subject research in this area that need improvement in order to solidify the best practices for training paraeducators.

Although many methodological inconsistencies were found within the single-subject literature base on paraeducator training, Brock and Carter's (2013) RCT was shown to be of adequate quality. Results from this study show that given effective training, emphasizing modeling and performance feedback, paraeducators can be taught to implement evidence-based practices.

2.4.1 Future Research

This review adds to the current literature base by evaluating the experimental evidence on paraeducator training and by identifying areas in need of continued research. Because so many paraeducators currently work within the special education system and since their role is constantly evolving (Killoran et al., 2001) researchers need to continue to investigate the different aspects of paraeducator training.

First, research is needed to identify the barriers that schools face when training paraeducators. All 11 studies examined varying training packages, yet the feasibility and practicality of these approaches was not discussed. If these approaches cannot be executed with fidelity due to extraneous circumstances (e.g., schedules, budgets, available trainers) then the research to practice gap will remain wide and practitioners will be left with minimal to no guidance. Understanding these interrelated facets could guide future research and allow for the development of more effective, practical, and feasible training programs.

Second, with performance feedback being an evidence-based practice (Fallon et al., 2015) that has shown promise within the teacher training literature (Auld, Belfiore, & Scheeler, 2010; Capizzi, Wehby, & Sandmel, 2010; Duchaine, Jolivette, & Fredrick, 2011) continued research that evaluates the feasibility of performance feedback as a primary method of paraeducator training may shed light on an effective way to train paraeducators. Within the reviewed literature, only one author delivered performance feedback alone (Robinson, 2011), while several authors used performance feedback alongside other didactic instruction approaches (Brock & Carter, 2013; Feldman & Matos, 2012; Maggin et al., 2012; Martella et al., 1993). Research that controls for and isolates the effects of didactic instruction may help to support the notion that didactic instruction alone may not an effective training approach for paraeducators

(Hans & Weiss, 2005; Noell, Witt, Gilbertson, Ranier & Freelan, 1997; Riley-Tillman & Eckert, 2001; Rose & Church, 1998). Further research that employs performance feedback alone may also help to evaluate whether performance feedback can stand alone as an effective training approach for paraeducators. Additionally, future investigation is needed that utilizes group performance feedback. All four studies within this review that contained performance feedback (Feldman & Matos, 2012; Maggin et al., 2012; Martella et al., 1993; Robinson, 2011), utilized individualized performance feedback. Because special education staff (e.g., paraeducators, teachers, administrators) often have busy schedules (Carroll, 2001) evaluating the effects of group performance feedback may reveal a training approach that is more feasible and time-friendly.

The field of special education could also benefit from future investigations that examine possible benefits of training paraeducators on more universal theories and practices that can be generalized and applied across contexts (e.g., setting, students, disability categories). Only two studies within this review examined the effects of a package of universal behavior management strategies (Feldman & Matos, 2012; Robinson, 2011), with both evaluating the effects of PRT specifically. Fundamental evidence-based classroom and behavior management practices have been show to improve student outcomes (Simonsen, et al., 2008); therefore moving beyond isolated student specific strategies and preparing paraeducators with foundational knowledge and skill-sets may serve to enhance both paraeducator behavior and student outcomes.

Lastly, future studies that examine paraeducator training should consider the guidance provided by Horner et al. (2005) and Kratochwill (2010) for single-subject research. Although several studies met most of the quality indicators, none of the studies met all of the standards. Ensuring that the quality standards are woven into each component of future studies can help

increase the validity of the reported outcomes and strengthen the current literature base on paraeducator training. Production of high quality studies can also serve to bridge the research to practice gap by evaluating paraeducator training practices systematically and using the results to provide practitioners with guidance on which approaches are effective, practical, and sustainable.

2.4.2 Implications for Practice

Together the studies in this review offer several considerations for school leaders as well as practical actions practitioners can enact at the district, school, and classroom level. Since the current legislation (i.e., NCLB, IDEA) does not provide guidance on what constitutes "appropriate" training, this review highlight the effects of the different training approaches that school administrators often use when attempting to "appropriately" train and supervise their paraeducators.

First, school administrators must first consider the diverse learning needs of their paraeducator staff. Results of this review indicate that paraeducators represent a wide variety of race, ethnicities, ages, education, and experience. These diverse characteristics may have an effect on the paraeducators' response to training. Second, providing training on fundamental and universal behavior management strategies, such as those found in PRT may be beneficial. Only three studies (Koegel et al., 2014; Feldman & Matos, 2012, Robinson, 2011) focused on non-student specific strategies that paraeducators can apply in other settings with other students. Further, being that didactic instruction has been shown be minimally effective (Barnes, Dunning, & Rehfeldt, 2001; Hans & Weiss, 2005) and five sets of authors in this review (Brock & Carter, 2013; Feldman & Matos, 2012; Maggin et al., 2012; Martella et al., 1993; Robinson, 2011) found positive effects using performance feedback it is recommended that administrators begin

to consider moving beyond the realm of didactic instruction by incorporating some level of performance feedback when training paraeducators. Lastly, relatively short paraeducator training sessions can have positive effects on both paraeducator behavior and student specific outcomes. Those studies that utilized performance feedback to train paraeducators did so through brief 15 to 20-minute meetings, either during the training session or immediately following and yielded positive outcomes (Feldman & Matos, 2012; Maggin et al. 2012; Martella et al.1993). Since positive outcomes can be achieved with fairly brief training sessions school leaders should consider allocating training time specifically for paraeducators a priority. Without proper training, paraeducators may be missing out on specific strategies that could potentially help them better support their students with disabilities in the school setting. For example, baseline data indicated that of the 29 paraeducators 11 did not use any of the targeted intervention strategies prior to training (Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; Malmgren et al., 2005; Robinson, 2011; Toelken & Miltenberger, 2012) 15 used them minimally (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Malmgren et al., 2005; Martella et al., 1993; McCulloch & Noonan, 2013; Robinson, 2011), and three paraeducators did not have baseline data reported relative to their performance (Quilty, 2007).

2.4.3 Conclusions and Questions

With paraeducators being the least trained individuals in the school setting, yet working with the most difficult student population (Brown et al., 1999), and with school districts removing paraeducators from the direct supervision of special education teachers through inclusion, the need for highly qualified and trained paraeducators becomes of even more importance. The results presented in this review suggest that paraeducator training is an effective practice that has

positive outcomes on both paraeducator and student performance. However, several methodological inconsistencies prevent the most effective approach to paraeducator training from being solidified.

Although there is minimal research on effective paraeducator training methods, there is a research base for effective teacher training practices. Within this literature base, researchers have found that didactic instruction (i.e., workshop style) alone is not enough for teachers to maintain newly acquired skills (Hans & Weiss, 2005; Noell et al., 1997; Rose & Church, 1998) and that training packages that include performance feedback have shown promising effects (Duchaine, Jolivette, & Fredrick, 2011; Hawkins & Heflin, 2011). Many studies have shown positive effects with performance feedback with teachers through both individual meetings (Codding, Livanis, Pace & Vaca, 2008; Rodriguez, Loman, & Horner, 2009) and small groups (Duhon, Mesmer, Gregerson, & Witt, 2009; Pellecchia et al., 2011), but didactic instruction still has a strong presence within the training practices of school districts (Sobeck & Robertson, Under Review). Specifically, of the 11 studies included in the literature review, eight sets of authors utilized some level of didactic instruction (Causton-Theoharis & Malmgren, 2005; Feldman & Matos, 2012; Koegel et al., 2014; Maggin et al., 2012; Malmgren et al., 2005; Martella et al., 1993; Quilty, 2007; Toelken & Miltenberger, 2012), while just three sets of authors incorporated performance feedback within a larger training approach (Feldman & Matos, 2012; Maggin et al., 2012 & Martella et al., 1993) and only one author used it as the primary method for training paraeducators (Robinson, 2011). One reason for reliance on didactic workshops may be that they are less expensive than performance feedback, which tends to require the continual support of a consultant. Currently, the use of performance feedback without external consultation has yet to be examined (Hagermoster-Sanetti, Fallon, & Collier-Meek, 2013). Additionally, many

professionals may feel that training approaches that incorporate performance feedback are impractical and not feasible within the constraints of the school structure (Allday et al., 2012; Chalk & Bizo, 2004; Kalis et al., 2007; Sutherland et al., 2001).

Considerations must also be given to the content focused on during paraeducator training sessions. The content of a training program is of equal value to the training approach, as one without the other neglects to achieve the preferred outcomes (Robinson, 2011). Within the current research base on paraeducator training only two sets of authors investigate the effects of training paraeducators on a package of foundational behavioral support strategies that can be used across a diverse range of students in varying settings (Feldman & Matos, 2012; Robinson, 2011). In both cases, the effects of training paraeducators in key strategies within a Pivotal Response Training (PRT) package were investigated. PRT is a systematic behavioral approach that uses scientifically based strategies (Simpson et al., 2005) designed for children with autism to improve targeted behaviors and produce collateral improvements across untargeted behaviors (Koegel et al., 2009). The remaining seven sets of authors focused specifically on strategies that paraeducator needed to learn in response to the specific needs of the students (Causton-Theoharis & Malmgren, 2005; Maggin et al., 2012; Malmgren et al., 2005; Martella et al., 1993; McCulloch & Noon, 2013; Quilty, 2007; Toelken & Miltenberger, 2012). Although individualized strategies are valuable, with school districts looking to inclusive practices (Giangreco, Suter, & Doyle, 2010; Minondo et al., 2001), training paraeducators on universal positive behavior support strategies becomes of even more importance. Although the current paraeducator training literature base does not provide guidance on which positive behavior support strategies are most vital for paraeducators to be fluent in, consideration should be given to the fundamental strategies based on the scientific principles of applied behavior analysis

which have been shown to be effective for addressing the deficits students with autism often experience (Lerman, Vorndran, Addison, & Kuhn, 2004).

Both the training approach and content focused on during training are vital to the effectiveness and usefulness of paraeducator training. Although the teacher training literature base sheds some light on the effectiveness of didactic instruction and performance feedback as instructional practices, the current paraeducator training literature base does not provide insight into whether one training practice is more superior to the other. This dearth of information leaves school leaders with minimal guidance on the most efficient and cost-effective way to train their paraeducators. Further, with the packed and overwhelmed schedules of staff in special education (Carroll, 2001) and with paraeducator training often overlooked (Giangreco et al., 2001) identifying which training approach is most effective may help school leaders plan professional development for paraeducators that is both meaningful and efficient. With didactic instruction and performance feedback being the two most prominent training approaches in the literature, analyzing the general and comparative effectiveness of both may also inform future research when designing and evaluating paraeducator training programs.

Therefore the purpose of this study will be to examine the general and comparative effectiveness of didactic instruction and performance feedback on paraeducators' use of positive behavior support strategies with children with disabilities in inclusive settings. Specifically, this study will address the following research questions:

1. What effect does didactic instruction have on paraeducators' use of positive behavior support strategies?
2. What effect does performance feedback have on paraeducators' use of positive behavior support strategies?

3. Is there a difference in paraeducators' immediate and sustained use of positive behavior support strategies when trained using didactic instruction or performance feedback?

3.0 METHODS

The purpose of the following study is to determine the general and comparative effects of a didactic instruction training program and a performance feedback training program. Specifically, this study will examine what effects each training approach has on paraeducators' use of positive behavior support strategies with children with disabilities in inclusive settings. By analyzing the general and comparative results of this study both researchers and practitioners will be provided with insight as to the difference in effects of the two training approaches on paraeducators provision of positive behavior support strategies.

3.1 SETTING AND PARTICIPANTS

3.1.1 Setting

A public elementary school in southwestern Pennsylvania served as the setting for the study. The school district serves approximately 2,355 students, of which, 18% have an IEP and 35% qualify for free and reduced lunches. Additionally, 94.3% are classified as being white, 3.1% as African-American, 1.8% as Multiracial, and .4% as Hispanic. The four regular education classrooms used in the study employed an inclusive teaching model with one classroom teacher and one special education paraeducator in each classroom. Paraeducator A's classroom was an eighth grade pre-

biology class with seven students with Individualized Educational Plans (IEP). Paraeducator B's classroom was a seventh grade world geography class with seven students with IEPs. Paraeducator C's classroom was a fourth grade social studies class with eight students with IEPs. Paraeducator D's classroom was a fifth grade science class with two students with IEPs. Each of the four classrooms had between 18-25 students and a minimum of two special education students with an Individualized Educational Plan (IEP) confirming the diagnosis of a disability and the need for paraeducator support. The regular education classroom served as the primary setting for all data collection sessions. Table 9 highlights the setting information per paraeducator.

3.1.2 Participants

The principal researcher (PI) recruited four paraeducators in a local public school. The paraeducators had varied backgrounds (i.e., education level, work experience, age, race/ethnicity) and all worked in different classrooms within the same school district. In order to participate in the study the paraeducator participants met the following requirements:

1. Worked in a public school district that served students in grades kindergarten through eighth grade.
2. Supported a minimum of one student with a disability in an inclusive setting during academic instruction. An inclusive setting was defined as a classroom in which a minimum of 80% of the students were identified as not having a diagnosed disability.
3. Provided behavioral student support. Paraeducators that performed solely the duties of a personal care assistant (PCA), such as self-help skills, adaptive skills, and physical assistance, did not meet the study participation requirements.

4. Had not been formally trained on the positive behavioral support strategies targeted within this study within the past five years.
5. Demonstrated minimal or no use of the strategies during screening observations.

The participants were four paraeducators who provided support to a minimum of two students with disabilities in four different general education classrooms: pre-biology, world geography, science, and social studies. The four paraeducators served students in fourth grade, fifth grade, seventh grade and eighth grade. Their years of experience ranged from seven years to 18 years and all four paraeducators extended their education beyond high school. Table 9 summarizes the paraeducator participant background information.

Table 9. *Paraeducator participant background information.*

Name	*Gender*	*Age*	*Race*	*Content Area*	*Grade*	*Years Experience*	*Highest Education Attainment*	*# IEP Students*
Para A	Female	57	Caucasian	Pre-Biology	8	13	1 yr. college	8
Para B	Female	53	Caucasian	World Geography	7	18	Some college credits	7
Para C	Female	47	Caucasian	Social Studies	4	7	Bachelors	7
Para D	Female	57	Caucasian	Science	5	10	3 yrs. college	2

Note. Classroom data is based on the class period observed for this study.

Although data was not collected on specific student outcomes, student participants were needed in order for the paraeducators to execute the targeted positive behavioral support strategies. The student participants must have met the following requirements:

1. Attend a public school that serves students in grades kindergarten through eighth grade.
2. Have a diagnosed disability. Students with multiple disabilities also met the study participation requirements.

3. Have a current IEP that specifies the need for paraeducator support while in inclusive settings.
4. Be classified as receiving supplemental (i.e., support services for more than 20% of the school day, but less than 80% of their day) or itinerant (i.e., support services for less than 20% of the school day) special education services per their IEP.
5. Participate in an inclusive classroom for academic instruction.

The four sets of students included in this study ranged in disability category with XX% having autism, XX% having emotional behavioral disorder, and XX% having other health impairment. Further, all students were not only included physically in the general education classroom, but they also completed the same academic work as their peers without disabilities. Modifications and adaptions were given to the students with disabilities as needed, but they were fully engaged in the same content and activities as the other students.

3.1.3 Recruitment Procedures

Once IRB approval was obtained (Appendix A; Figure 5) the assistant superintendent from a local school district was invited to have his school participate in the study. A meeting was then held to discuss the details of the study with the director of special education. After sharing the inclusion criteria for paraeducator participants with the director of special education, a meeting was arranged with five paraeducators that the director of special education thought would be able to participate in the study. Upon obtaining the school district's approval, the PI held an informational meeting with the five selected possible paraeducator participants and the director of special education. During this time the PI reviewed the details of the study and answered any

questions the paraeducators had. Of the five participants, four felt that they might be a good fit for the study. Screenings were then arranged for these four paraeducators.

3.1.4 Screening Procedures

Screening procedures were conducted prior to the start of the study in order to ensure all participants met the inclusion criteria of the study. The screening procedure included two steps. First, all four possible paraeducator participants completed a questionnaire that focused on their demographic information, current job responsibilities, past experiences, completed trainings, their perspective on their role, as well as any behavior support strategies they felt they use most often. The questionnaire also included space for possible participants to share strategies or specific areas to which they felt training would provide the most benefit.

The second part of the screening process involved classroom observations. The four paraeducators were observed to ensure that they were not currently using the targeted antecedent strategies consistently and with fidelity. Data were collected on all three targeted positive behavioral support strategies during each observation. The PI assessed all of the screening videos while a research assistant also assessed 50% of the screening videos. Once the initial meetings, questionnaires, and observations were complete the PI determined that the four paraeducators met the inclusion criteria and were able to participate in the study. Therefore the four participants that were selected were the first four paraeducators who met inclusion criteria. All four paraeducators signed a consent to participate in the study during the screening process.

3.2 MATERIALS AND STAFF

The materials required for this study included four video cameras equipped with a memory card, microphone set, batteries, and tripod, one external hard drive, one set of headphones, and one audio recorder. Materials used to deliver the two interventions included four two-page descriptions of the targeted positive behavioral support strategies, one PowerPoint presentation specific to two of the dependent variables, didactic instruction handouts, and data collection documents. Additionally, a research assistant was hired to assist with the implementation of didactic instruction training, the coding process, the calculation of IOA, and the fidelity assessment. Materials associated with the study are described in detail in the procedures and a list of all the materials can be found in Appendix B.

3.3 DEPENDENT AND INDEPENDENT VARIABLES

3.3.1 Dependent Variables

The three dependent variables consisted of three positive behavior support strategies implemented by the paraeducators: effective behavior specific praise, effective opportunities to respond, and effective instruction and commands. Table 10 provides the specific steps of each strategy, examples and non-examples, and the research supporting each strategy's use. Although the paraeducators' were placed in the inclusive classroom to support students with disabilities, their use of the strategy was counted when used wit both special education students and general education students. The behaviors were measured using a frequency count during a continuous

20-minute observations during academic instruction, five days a week. All observations occurred during the same instructional time each day. In order to capture the same instructional time each day, the PI scanned each video and selected continuous 20-minute portions of the class session that were most similar in order to control for unusual class activities (e.g., student presentation, videos, tests). For example, each 20-minute coded session included a portion of teacher presentation, guided practice, and independent or group work. During each session the PI scored the paraeducators' correct use of all three positive behavior support strategies. Across all phases five baseline sessions, nine intervention sessions, and five maintenance sessions were viewed and scored for each paraeducator's use of the three DVs.

3.3.1.1 Effective behavior specific praise (BSP) BSP was defined as contingent (i.e., occurring immediately after the desired behavior) verbal statements of approval provided to a student, or students, by a paraeducator that includes a reference to or a description of the behavior being praised (Conroy et al., 2009; Hawkins & Heflin, 2011). Statements needed to be academic or behavioral in nature and had to follow all five of the following steps in order to be counted as effective. First, paraeducators had to obtain the student's attention by doing or saying any of the following: saying their name, getting to eye level with the student, making eye contact, or changing their body position to be aligned with the student in a face-to-face manner. Second, paraeducators had to deliver one praise statement (e.g., good, great, excellent) or affirmative phrase (e.g., I like the way you are…, Thank you for…, I love that you…). Third, the paraeducator had to identify the behavior they were specifically reinforcing. Fourth, the paraeducators needed to maintain an affirmative or neutral affect throughout the entire interaction. Interactions that included sarcasm or coercive comments were coded as ineffective. Lastly, paraeducators were required to provide a minimum of three seconds of wait time before

giving a redirection or reprimand. For example, a comment such as, “I like the way you are organizing your materials, but you need to be listening to the teacher,” were coded as ineffective. Table 10 provides the specific steps of BSP, examples and non-examples, and the research supporting BSP.

3.3.1.2 Effective opportunities to respond (OTR) OTR was defined as an interaction between a paraeducator formulated question and the academic response given by the student or students (Schnor et al., 2015). Specifically, effective OTR was described as a questioning technique that served to begin, review, or extend a learning trial (Conroy et al., 2008). These questions could have been presented verbally or in written form and did not need to be successful in obtaining a correct student response.

In order to be counted as an effective OTR paraeducators needed to complete the following five steps. First, paraeducators had to obtain the student’s attention by doing or saying any of the following: saying their name, getting to eye level with the student, making eye contact, or changing their body position to be aligned with the student in a face-to-face manner. Second, paraeducators had to deliver one academic question. The question had to be academic in nature and also had to require that the student process academic content in order to offer a response. Questions had to focus on who, what, when, where, or why and had to reference the content the student was learning. For example, if a student was in science class the question had to be about science and reference the specific content being learned that day. Questions that focused on how the student was learning were coded as ineffective. For example, asking a student if they understand the direction or if they are doing ok were coded as ineffective. If more than one question was delivered within a three second period of time, then that OTR was coded as ineffective. Third, the question delivered had to be clear and concise. If paraeducators

included vague words (e.g., this, that, there, it, etc.) without gesturing to specific academic material, the OTR was coded as ineffective. Similarly, if the paraeducator provided a very lengthy question with additional statements after the question, it was coded as ineffective. For example, “Who is the president of the United States? Remember we talked about this two weeks ago and Tony answered correctly. Try to think of the rhyme we said to remember his name. What is his name?” Fourth, the paraeducators needed to maintain an affirmative or neutral affect throughout the entire interaction. Interactions that included sarcasm or coercive comments were coded as ineffective. For example, “You should know this Sally. Is a plant biotic or abiotic?” Lastly, paraeducators were required to provide a minimum of three seconds of wait time or wait until the student responded, whichever came first, before giving a prompt, choice, question, or clarification. For example, a comment such as, “A see-saw is an example of what kind of simple machine? Is it a plane? Is it a wheel and axel? Is it a lever? Think about what a see-saw looks like. What are the parts of a see-saw?,” were coded as ineffective. Table 10 provides the specific steps of OTR, examples and non-examples, and the research supporting OTR.

3.3.1.3 Effective instruction and commands (EIC) EICs were defined as the delivery of requests or commands given by the paraeducator that were behavioral in nature (Kern & Clemens, 2007). Each direction had to contain a “do” command that clearly stated the behavior for the student to engage in (Forehand & McMahon, 1981). Commands were required to be direct, specific, phrased positively, given one at a time (or at a developmentally appropriate pace), and given with enough wait time for the student to respond (Forehand & McMahon, 1981). In order to be counted as an effective EIC paraeducators needed to complete the following five steps. First, paraeducators needed to obtain the student’s attention by saying their name, getting to eye level with the student, making eye contact, or changing their body position to be

aligned with the student in a face-to-face manner. Second, paraeducators had to deliver one to three behavioral commands. For example, “Please sit down, get out your pencil, and look at the teacher.” If a paraeducator directed a student to engage in four or more behaviors in a sequence, the command was coded as ineffective. Third, the directives given to the student(s) needed to be clear and concise. The paraeducator was required to clearly state the directive. For example, merely telling the student to “look” or “pay attention” were coded as ineffective, but statements such as “look at the teacher” or “pay attention to your partner talking” were coded as effective. Further, directives needed to be concise and focused on the “do” command. For example, comments like, “You need to walk up to the table and get three sheets of paper for your group before you can start writing the list of materials you need to complete the lab. You group is counting on you to get enough pieces of paper for everyone,” were scored as ineffective due to not being concise. Fourth, the paraeducators needed to maintain a firm, yet quiet toned voice throughout the entire interaction. Interactions that included sarcasm, coercive comments, yelling, or ultimatums were coded as ineffective. Finally, paraeducators were required to provide a minimum of three seconds of wait time or wait until the student responded, whichever came first, before prompting, redirecting, or giving the student another command. Table 10 provides the specific steps of EIC, examples and non-examples, and the research supporting EIC.

Table 10. *Examples, non-examples, steps, and supportive research relative to the dependent variables.*

Strategy	Examples	Non-Examples	Steps	Supportive Research
BSP	1. "Excellent adding those numbers." 2. "I like how you showed your work on the math problems." 3. "Thank you for starting your work quietly and quickly." 4. "Great job keeping your eyes on the board."	1. "Good job." 2. "Great idea." 3. "You did problems two and three." 4. "You are right, that is the correct answer."	1. Gain student's attention. 2. Deliver praise. 3. Identify the behavior being reinforced. 4. Maintain an affirmative or neutral tone. 5. Wait time of 3 seconds.	Allday et al., (2012); Chalk & Bizo (2004); Duchaine et al., (2011); Hawkins & Hefline (2011); Simonsen et al., (2010)
OTR	1. "Who is the author of the story?" 2. "Which two countries were involved in the Cold War?" 3. "How many wheels are we going to need to build our car?" 4. "Is the plant biotic or abiotic?"	1. "Answer your math problems." 2. "Read paragraph one." 3. "Are you learning this?" 4. "How are you doing with the science lab?"	1. Gain student's attention. 2. Deliver one academic question. 3. OTR is concise and clear. 4. Maintain an affirmative or neutral tone. 5. Wait time of 3 seconds.	Conroy et al., (2008); Partin et al., (2010); Schnor et al., (2015)Simonsen et al., (2010); CEC (1987); Sutherland et al., (2003); Sutherland & Wehby (2001)
EIC	1. "Sit down." 2. "Look at the teacher." 3. "Walk to the table and get two pieces of paper." 4. "Sit with Tony and pay attention to Mrs. Smith giving the directions."	1. "Sit down, write your name on your paper, get your book out and turn to page 65." 2. "Shhh, Listen." 3. "Pay attention." 4. "Look."	1. Gain student's attention. 2. Deliver one to three commands(s). 3. EIC is concise and clear. 4. Firm, quiet tone of voice. 5. Wait time of 3 seconds.	De Martini-Scully et al., (2000); Kern & Clemens (2007); Matheson & Shriver (2005); Musser et al., (2001)

3.3.2 Social validity

Both the paraeducator and classroom teacher completed a satisfaction questionnaire specific to the training program as a means to train paraeducators and the effects the training program had on paraeducator behavior. The classroom teachers completed a 13 statement 5-point Likert scale questionnaire with two additional open-ended questions (Appendix C). The paraeducators completed a questionnaire that consisted of a total of 18 questions. Of the 18 questions, 13 were formatted with a 5-point Likert-style scale to which individuals rated specific aspects of their experiences (Appendix D). A score of one indicated that they "strongly disagreed" and a score of five indicated that they "strongly agreed." The remaining five questions were open-ended questions. Areas that were addressed within the questionnaire included: (a) effectives of the training, (b) ease of use of the strategies, (c) overall opinion of the trainings and strategies, (d) time and burden associated with the trainings and strategies, (e) maintenance of the strategies, and (f) specific training components that were most and least helpful.

3.3.3 Independent Variables

Three IVs were measured within the study: a didactic instruction training approach, a performance feedback training approach, and a control measure. The matching of the IVs to the DVs was counterbalanced across the four participants (e.g., didactic instruction was paired with BSP for participant A and C while BSP was given didactically for participant B and D). The IVs are described in further detail in the procedures.

3.4 EXPERIMENTAL DESIGN

A single subject research design was used in this study. An adapted alternating treatments design (AATD) replicated across four paraeducators was employed in order to determine if a functional relationship between the IVs and DVs existed. The AATD replicated across four participants demonstrated within-participant comparisons with the IV present (i.e., intervention) and not present (i.e., baseline and maintenance) across four individuals. Single-subject studies that include a minimum of three effect demonstrations and show the effects of the IV reliably through replication provide a strong demonstration of experimental effect of the intervention (Cooper, Heron, & Heward, 2007) and can be used to establish evidence-based practices (Horner et al., 2005). One advantage to the AATD design is that it allowed for rapid comparisons of all the conditions (Kratochwill, 2010), including within-subject comparisons as well as general comparisons across participants and interventions.

An AATD is a variation of the alternating treatments design (ATD; Sindelar, Rosenberg, & Wilson, 1985). Unlike an ATD where the treatments are applied to the same behavior, in an AATD the treatments are applied to different, but equally complex, behaviors. In addition to being different and equally complex, the targeted behaviors must also be functionally independent from one another so that one behavior does not change when the other is under treatment (Wolery, Bailey, & Sugai, 1988). Task equivalence is established by a logical analysis (i.e., skills matched on the number and nature of the requirements needed in order to do the skill) of the behaviors and baseline data. A baseline that shows equivalent performance of the behaviors is followed by a treatments condition in which the acquisition of one behavior taught by one approach is compared to the acquisition of the second behavior taught by the second approach (Sindelar, Rosenburg, & Wilson, 1985). Experimental control is demonstrated through

the level and trends in the data during the treatments phase of the study (Wolery, Bailey, & Sugai, 1988) and through the differences in rate of acquisition across subjects, settings, or behaviors (Sindelar, Rosenburg, & Wilson, 1985). Since a different treatment is applied to a different behavior, the AATD design can be used with both reversible and nonreversible behaviors and alleviates any conflict with discriminating the separation of treatments. Replication is not built into the design and, therefore, must be shown across participants or behaviors (Wolery, Bailey, & Sugai, 1988). Order effects are controlled for similar to the ATD by counterbalancing the order of treatments (Schlosser, 1999).

3.4.1 Task Similarity

In order to assess the similarity and difficulty of the three positive behavior support strategies (i.e., behavior specific praise, opportunities to respond, commands and instruction) a logical analysis was completed (Sindelar, Rosenberg, & Wilson, 1985). First, the skills of each behavior were identified and ordered. Then, the skills were matched across DVs to ensure that number and nature of the requirements needed to complete each skill within each DV were equal, but functionally different across all DVs. Second, three teachers, one school psychologist, one special education professor, one special education doctoral student, and one psychology professor who were blind to the purpose of the study reviewed a detailed write-up of each strategy and completed a rubric to evaluate the similarity of the three strategies. A modified version of the rubric used by Miltenberger and Charlop (2015) was used to compare the strategies across several domains (e.g., type of strategy, verbal and physical skills required, time needed to implement, function of the strategies, materials needed, level of difficulty to implement). See Appendix E for a sample rubric. Finally, baseline data were collected and

served to show similarities among the paraeducators' use of the positive behavior support strategies before intervening.

All of the seven individuals who completed the logical analysis rubric felt that all three of the DVs had a similar topography (i.e., verbal statements), but had varying functions. Of the seven individuals 100% felt that the function of OTR was academic, 57% felt that function of EIC was behavioral and 43% thought the function could be behavioral or academic, and 71% felt that that function of BSP was behavioral while 29% thought the function could be behavioral or academic. Further, three individuals (43%) noted that in OTR and EIC the paraeducator interaction precedes the student behavior while BSP occurs after the student behavior. Therefore, each DV had similar topography, but were functionally different from one another. An OTR was an academic strategy that precedes student behavior, EIC was a behavioral strategy that precedes student behavior, and BSP was a behavioral strategy that is delivered after student behavior. Additionally, all seven individuals determined that the all three DVs did not require any additional adults or materials in order to implement the strategy and that each DV required the same amount of steps. Six of the seven individuals (86%) felt that the three DVs were free operants and that some advanced planning was required across all three DVs (e.g., prepare what to ask for an OTR, prepare what to instruction a student to do for an EIC, prepare what behavior to praise for a BSP). Finally 86% of the individuals felt that the three DVs were equally difficult to implement, while one individual (14%) felt that delivering an OTR might have required slightly more preparation.

3.5 PROCEDURE

3.5.1 Baseline

Baseline sessions were conducted in each student's inclusive classroom. During baseline the paraeducators continued with business as usual and no instruction or feedback was given. The paraeducators were unaware of the positive behavior support strategies being assessed. Baseline data were collected on all three DVs and sessions continued until a stable rate of responding was evident, with a minimum of five data points. Only two data points were recorded for one paraeducator due to technology issues with her microphone and schedule constraints. Stable responding was defined as performance scores within two occurrences from one another and with an even or descending trend. The paraeducators were deemed ready to move into the intervention phase once a minimum of five steady baseline data points were collected during the week prior to the scheduled didactic instruction session. If a paraeducator did not have stable performance during the five baseline sessions the PI determined that the paraeducator would be withheld from the scheduled whole group didactic instruction session and be given an individualized one-on-one didactic instruction session once baseline data became stable. Data was collected five days a week through 20-minute videotaped sessions.

3.5.2 Intervention

During the interventions condition three IVs were assessed: a didactic instruction training approach, a performance feedback training approach, and a control measure. In order to support the internal validity of the study, the training approaches were counterbalanced with the DVs

across all four paraeducators. For example, paraeducator A and C received performance feedback on BSP and didactic instruction on OTR while paraeducator B and D received performance feedback on OTR and didactic instruction on BSP. Data were also collected on the paraeducators' use of EIC which served as a control measure. Further, in order to make the amount of time needed for training equal among the training programs, the amount of time the paraeducators participated in the didactic instruction was equal to the amount of time paraeducators spent being observed and given performance feedback sessions. Specifically, paraeducators participated in one three-hour (i.e., 180 minutes) didactic instruction session specific to either BSP or OTR and nine 20-minute performance feedback sessions (i.e., 180 minutes), consisting of 15 minutes of observation and five minutes of feedback, specific to the other opposite strategy they did not receive didactic instruction on. For example, two paraeducators received one three-hour didactic instruction session on OTR and nine 20-minute performance feedback sessions on BSP, while the other two paraeducators received one three-hour didactic instruction session on BSP and nine 20-minute performance feedback sessions on OTR. Controlling for time allowed the PI to evaluate the two training approaches based on the amount of time a school administrator, or other personnel, would need in order to carry out the approach. Although the paraeducators only engaged in five minutes of face-to-face discussion during each performance feedback session, in order for performance feedback to be implemented a school administrator must spend time observing the paraeducator. Observation and verbal feedback were considered two active ingredients of this training approach. At the conclusion of the nine 20-minute performance feedback sessions the intervention condition concluded and the maintenance condition began. The intervention condition ended after the nine sessions, regardless of their performance, since time was being controlled for 180 minutes.

3.5.2.1 Didactic instruction The didactic instruction approach consisted of one ½ day (i.e., three hours) presentation-style training given to all 20 paraeducators in the school district. The training was provided to all of the paraeducator staff within the district in order best mimic a traditional in-service day training. Although only four paraeducators continued on to participate in the study, the PI felt providing the didactic training to all of the district's paraeducators would make the training session most similar to a typical workshop for the four paraeducator participants. For example, in-service trainings are not usually given in a one-on-one or one-on-two format. Of the four paraeducators that participated in the study, two attended the morning session on OTR and did not attend the afternoon session, while the other two paraeducators attended the afternoon session on BSP and did not attend the morning session. During the didactic instruction sessions the PI and research assistant used a power point presentation to describe the strategy (i.e., OTR or BSP), provide the background and rationale for its use, share examples and non-examples, and model the strategy. Time was given for paraeducators to discuss the strategy in both small groups and large group formats and to ask questions throughout the presentation. Paraeducators also watched a video clip of the strategies in action and completed two activities that presented scenarios specific to the strategy.

After a careful review of the paraeducator training resources available through the Pennsylvania Department of Education, the power point presentation-style training was designed to mimic this presentation-style format. Further, additional resources were used to design the didactic training session, including Gillian Nicholls' book, *Developing Teaching and Learning in Higher Education* (Nicholls, 2002). The content presented that was specific to the positive behavior support strategies was derived from the current literature base on OTR (Berrong, Schuster, Morse, & Collins, 2007; Conroy et al., 2008; Randolph, 2007; Schnor et al., 2015;

Sutherland et al., 2002; Sutherland & Wehby, 2001;) and BSP (Allday et al., 2015; Bost & Ricomini, 2006; Cavanaugh, 2013; Chalk & Bizo, 2004; Conroy et al., 2009; Duchaine et al., 2011; Hawkins & Heflin, 2011; Murray & Pianta, 2007). See Appendix F-M for associated didactic instruction handouts.

3.5.2.2 Performance feedback The performance feedback intervention consisted of two elements: a 10-minute one-on-one description of the strategy and nine one-on-one performance feedback sessions. Several scheduling conflicts and days of inclement weather prevented the sessions from occurring consistently each school day for three of the participants. Therefore, each paraeducator was given 180 minutes of performance feedback (i.e., nine 20-minute sessions), but the number of school days during which the paraeducators were in the performance feedback condition ranged across all four paraeducators from nine school days to 13 school days.

During the initial meeting the PI provided the participants with a two-page description of the strategy and gave them two minutes to read over the content. The two-page description contained (a) a description of the strategy; (b) the rationale for its use (c) several examples of the strategy (d) several non-examples of the strategy, and (e) the steps needed to implement the strategy correctly. Once the participants finished reading the content, the PI used six minutes to review the content and another two minutes to answer the participant's questions.

The PI observed each paraeducator for a 15-minute period of time during the targeted inclusive classroom setting each school day, unless a schedule conflict or inclement weather prevented the session form occurring. During this observation the PI recorded the frequency at which the paraeducator implemented the targeted strategy with fidelity. This frequency count was then shown to the paraeducator during the five minute performance feedback meeting in the

form of a graph. This data was only used for performance feedback purposes and was not represented on the paraeducators' graphs. Observations continued until nine observation sessions were completed. The PI observed the paraeducator for 15 minutes and met with the paraeducator immediately following the conclusion of the class session.

During the performance feedback sessions the PI shared a minimum of two of the paraeducator's strengths, as well as a minimum of two areas for improvement specific to the targeted strategy. The paraeducator was also provided with a graphical display of their progress relative to the strategy in which they were receiving performance feedback. One minute was also allocated for questions at the end of each feedback session. Each performance feedback meeting was five minutes long and occurred each school day, unless a schedule conflict or inclement weather prevented the session form occurring, until nine feedback sessions were completed.

3.5.2.3 Control measure The control measure consisted of data collection on the paraeducators use of EIC. The paraeducators were not aware that data was being collected on this behavior and no instruction or feedback was given regarding EIC. Data was collected on the control measure throughout baseline, interventions, and maintenance.

3.5.3 Maintenance

During the maintenance condition all interventions were withheld and the paraeducators continued to be assessed on the use of all three positive behavior support strategies (i.e., OTR, BSP, EIC). Paraeducators videotaped the same class session twice a week for five consecutive weeks following the conclusion of the intervention condition. The PI randomly selected one of the two weekly videos to code for maintenance data.

3.5.4 Implementation Fidelity

All strategy review sessions and performance feedback training sessions were recorded in order to assess the implementation fidelity of each IV. A research assistant also scored the two didactic instruction trainings in vivo using a fidelity check list. The implementation fidelity documents can be found in Appendix N-P.

Implementation fidelity was assessed in vivo for both the OTR and BSP didactic instruction sessions using a checklist in a yes/no format. A score of 100% was obtained for both sessions, indicating that all steps in the training session were completed as planned.

Implementation fidelity was also assessed on all four of the 10-minute strategy review sessions (100%) and 33% of the performance feedback sessions using audio recorded sessions and a fidelity checklist. Both checklists were in a yes/no format and were used to record whether or not all of the components were used during each training session. If the PI fell below a fidelity score of 95% during any performance feedback session, the research assistant and PI reviewed the audio and developed a corrective plan.

A mean of 95% (*Range* = 80% -100%) was calculated for the strategy review sessions and a mean of 100% was obtained for performance feedback sessions. Therefore, the total mean for all implementation fidelity components was 99% (Table 11).

Table 11. *Mean Implementation Fidelity scores across study components.*

	Implementation Fidelity	
	Strategy Review	Performance Feedback Sessions
Para A	100%	100%
Para B	100%	100%
Para C	80%	100%
Para D	100%	100%
Implementation Fidelity Means Per Study Component:		
Strategy Review		95%
Performance Feedback Sessions		100%
Didactic Instruction Session: BSP		100%
Didactic Instruction Session: OTR		100%
Total Mean Implementation Fidelity Across All Components		99%

3.5.5 Interobserver Agreement

A research assistant was trained to conduct point by point Interobserver Agreement (IOA). The research assistant was a graduate student in the Doctor of Education (EdD) in special education at the University of Pittsburgh. In addition to a Master's degree in special education, he held a Board Certified Behavior Analyst (BCBA) certification and had relevant work experience. After reviewing the coding scheme for data collection specific to the DVs, the PI and research assistant practiced coding several 15-minute videos. Training continued until a score of 80% or higher was reached across three 15-minute videos.

Point by point IOA was used in order to accurately record and compare each occurrence of the targeted behaviors. An agreement was defined as both the PI and research assistant scoring an occurrence of the same DV within three seconds of one another. If the PI and research assistant scored the occurrence of the same DV more that three seconds from one another they were coded as two different occurrences and counted as such. In order to calculate IOA the PI

and research assistant's total number of agreements was divided by the number of agreement plus disagreement and multiplied by 100 (Watkins & Pacheco, 2000) to obtain a percentage for each phase and each paraeducator. The final IOA percentage represents the PI and research assistant's agreement across all three conditions across all four paraeducators.

The research assistant coded 32% of sessions, across all conditions (i.e., baseline, interventions, and maintenance) and all four participants. The PI and research assistant maintained a minimum of 80% agreement across all conditions and participants. If IOA fell below 80%, the PI and research assistant reviewed the definitions of the DVs and independently re-watched and re-assessed the video. All sessions were video-taped in order to accurately assess reliability.

The total mean IOA for all paraeducators across all phases was 96%. Table 12 shows the IOA across each phase of the study as well as across each paraeducator.

Table 12. *IOA averages across paraeducators and phases.*

	Baseline	*Intervention*	*Maintenance*	*Total IOA Per Para*
Para A	100%	96%	98%	98%
Para B	100%	94%	97%	97%
Para C	100%	95%	88%	94%
Para D	100%	91%	95%	95%
Total IOA Average Per Each Phase	**100%**	**94%**	**95%**	**96% Total IOA Average Across Paraeducators**

3.6 DATA ANALYSIS

Single subject research involves visual inspection of graphed data in order to assess the effect of the IV on the DVs (Horner et al., 2005). Visual examination of graphed data that evaluates the level, trend, variability, overlap, immediacy of the effect, and consistency of data patterns across similar phases (Kennedy, 2005; Parsonson & Baer, 1978) serves to determine if there is a "strong evidence, moderate evidence, or no evidence of a casual relation" (p. 16; Kratochwill et al., 2010). Therefore, visual analysis using the six variables listed above was used to determine what effect, if any, the training approaches had on paraeducator performance across conditions (i.e., intervention, maintenance). This visual analysis was then used to identify any differences between the treatment effects to determine which training approach was most effective. The data was collected via videotape and then scored and graphed immediately. Data were analyzed on an ongoing basis in order to determine when the conditions change was to occur from baseline to interventions. Data collection concluded when an equal amount of time spent between the didactic instruction training and performance feedback sessions was reached. For example, 180 minutes were spent during the didactic instruction training, so data collection concluded when 180 minutes of performance feedback training were completed.

In addition to visually examining the data, the mean was calculated for each participant's performance with each IV and DV within each condition in the study. Determining the mean allowed for simple comparisons to be made between phases (Kennedy, 2005). Data were analyzed in order to answer the following questions: (a) What is the effect of didactic instruction training on paraeducators' use of positive behavior support strategies? (b) What is the effect of performance feedback training on paraeducators' use of positive behavior support strategies? (c)

Is there a difference in paraeducators immediate and sustained use of positive behavior support strategies when trained using didactic instruction or performance feedback?

4.0 RESULTS

The results are organized into four sections, with each section representing each paraeducator participant. Within each section there are four subsections: baseline, intervention, maintenance, and a graphical display of data. This format allows each paraeducator participant to be viewed and analyzed as their own study more easily, while making concluding connections across participants once each data set is examined.

4.1.1 Paraeducator A

Paraeducator A provided support to seven students with disabilities in an eighth grade pre-biology middle school inclusive classroom. She participated in the didactic instruction training session on OTR and she received performance feedback on BSP. The results of Paraeducator A's performance is displayed in Figure 1.

4.1.1.1 Baseline During baseline Paraeducator A consistently demonstrated minimal use of effective OTR (*M* = 1.2), BSP (*M* = 0), and EIC (*M* = .2) across five observation sessions. The rate of responding was low and stable across all three DVs.

4.1.1.2 Interventions

Performance Feedback/BSP Upon introduction of performance feedback, BSP immediately increased from zero in baseline to seven in session eight. The frequency of BSP continued with an increasing trend with some variability over the next several sessions reaching a maximum of 23 during session 17. Paraeducator A's use of BSP maintained at a higher level in the intervention phase (*M* = 12.4) than in baseline (*M* = 0), with the frequency of BSP ranging from 7-23. There was no overlap between BSP baseline performance and BSP intervention performance, resulting in a considerably higher level during intervention. The BSP mean increased from zero in baseline to 12.4 in intervention. Further, there were no instances of overlap between BSP and Control/EIC (0%) and only three instances of overlap between BSP and Didactic Instruction/OTR (33%) during the intervention condition.

Didactic Instruction/OTR Upon completing the didactic training session on OTR, Paraeducator A's rate of OTR did not immediately change. During intervention Paraeducator A had two occurrences of OTR during session eight, three in session nine, zero in session 10 and then during session 11 Paraeducator A reached seven occurrences. Upon reaching a rate of seven OTRs in session 11, a downward trend occurred from session 12 to session 13, with sessions 16-18 containing zero OTR (*M* = 1.9).. Six of the nine OTR intervention data points (66%) overlapped with the OTR data points in baseline, resulting in an OTR level similar to baseline. The OTR mean increased from 1.2 in baseline to 1.9 in intervention. Further, there was only one

instance of overlap between OTR and Performance Feedback/BSP (11%) during the intervention condition, while all nine Control/EIC data points overlapped with all nine OTR data points (100%).

Control/EIC During the intervention phase Paraeducator A had one EIC during session 13. All other intervention sessions resulted in an EIC score of zero (M = .1). All nine data points (100%) overlapped with the EIC data points in baseline. The EIC mean decreased from .2 in baseline to .1 in intervention. Further, all nine EIC data points overlapped with the Didactic Instruction/OTR data points (100%) during intervention, while there were no occurrences of overlap between EIC and Performance Feedback/BSP.

4.1.1.3 Maintenance Maintenance data was collected five, 10, 16, 21, and 26 days after the conclusion of the intervention phase.

Performance Feedback/BSP During the maintenance condition Paraeducator A demonstrated a slightly decreasing trend but continued to deliver a moderate rate of BSP, reaching 17 occurrences during session 28 (M = 12.4). The level of performance during maintenance was slightly lower than intervention, but still significantly higher than baseline. No BSP maintenance data points overlapped with BSP baseline data points. However, four out of five of the BSP maintenance data points (80%) did overlap with the intervention BSP data points resulting in a similar BSP level in maintenance and intervention. The remaining maintenance BSP data point was lower than the BSP data points in intervention, with maintenance data ranging from 5 to 17. Further, comparing the BSP maintenance data points to Didactic Instruction/OTR maintenance data revealed one instance of overlap (11%) and compared to maintenance Control/EIC there were no instances of overlap. Similarly, there was also one

instance of overlap between BSP maintenance data and Didactic Instruction/OTR intervention data (11%) and no instances of overlap between BSP maintenance Control/EIC intervention data.

Paraeducator A's mean score for BSP increased from 0 during baseline to 12.4 during intervention remained the same at 12.4 during maintenance.

Didactic Instruction/OTR During maintenance four out of the five sessions (80%) showed no use of OTR, producing a slight downward trend. The OTR level during maintenance was slightly higher than the OTR baseline level and similar to the OTR intervention level (*M* = 1.4). Four of the five maintenance data points (80%) overlapped with both baseline and intervention data. Paraeducator A's use of OTR was similar during all three conditions with no immediate changes or significant increase in level. Further, only one of the OTR maintenance data points overlapped with the Performance Feedback/BSP maintenance data (20%), while none of the OTR maintenance data points overlapped with Performance Feedback/BSP intervention data. Four out of the five OTR maintenance data points (80%) overlapped with both the Control/EIC maintenance data and Control/EIC intervention data. Paraeducator A's mean score of OTR increased from 1.2 during baseline to 1.9 during interventions and then decreased to 1.4 during maintenance.

Control/EIC Paraeducator A continued to have minimal to no use of EIC during maintenance. Four out of the five (80%) of the EIC maintenance data points showed no occurrences of EIC, while the remaining data point showed only two occurrences during session 28 (*M* = .4). The level for EIC during maintenance was similar to baseline and intervention with four of the five EIC maintenance data points (80%) overlapping with both EIC baseline data and EIC intervention data. Similarly, four of the five EIC maintenance data points also overlapped

with Didactic Instruction/OTR (80%) maintenance data, while no instances of overlap were shown between EIC maintenance data and Performance Feedback/BSP maintenance data. Further, all of the EIC maintenance data points overlapped with Didactic Instruction OTR intervention data, while no instances of overlap were shown between EIC maintenance data and Performance Feedback/BSP intervention data. Paraeducator A's mean score of EIC decreased from .2 during baseline to .11 during intervention and then increased to .4 during maintenance.

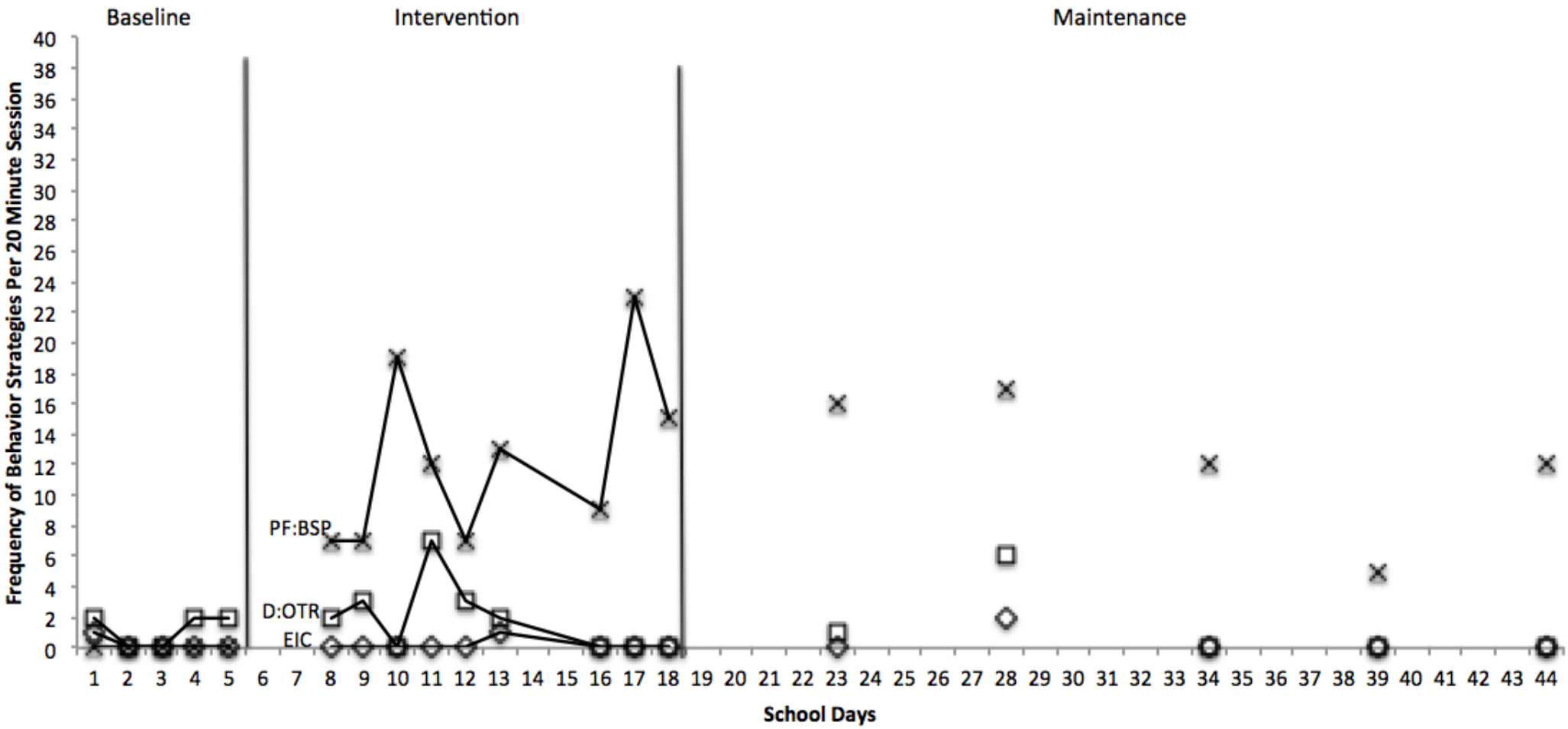

Figure 1. *Frequency of Positive Behavior Support Strategies for Paraeducator A.*

Note: *PF:BSP*- Performance Feedback on Behavior Specific Praise, *D:OTR*- Didactic Instruction on Opportunities to Respond, and *EIC*- Control Condition with Effective Instruction and Commands

4.1.2 Paraeducator B

Paraeducator B provided support to seven students with disabilities in a seventh grade world geography middle school inclusive classroom. She participated in the didactic instruction training session on BSP and she received performance feedback on OTR. The results of Paraeducator B's performance are displayed in Figure 2.

4.1.2.1 Baseline During baseline Paraeducator B consistently demonstrated no use of effective OTR (M = 0), BSP (M = 0), and EIC (M = 0) across five observation sessions. Her rate of responding was stable at zero across all three DVs.

4.1.2.2 Intervention

Performance Feedback/OTR Upon introduction of performance feedback, OTR immediately increased from zero in baseline to 11 in session nine, 14 in session 10, and then slightly decreased to seven during session 11. Once reaching seven occurrences during session 11, the frequency of OTR continued to increase steadily, reaching 22 during session 21. An increasing trend was demonstrated throughout the intervention phase with minimal variability. Paraeducator B's use of OTR maintained at a much higher level in the intervention phase (M = 13.7) than in baseline (M = 0), with the frequency of OTR ranging from 7-22. There was no overlap between OTR baseline performance and OTR intervention performance, resulting in a substantially higher level in intervention. The OTR mean increased from zero in baseline to 13.7 in intervention. Further, three distinct levels of data were demonstrated among the DVs resulting in no instances of overlap between OTR and Control/EIC (0%), nor between OTR and Didactic Instruction/BSP (0%) within the intervention condition.

Didactic Instruction/BSP Upon completing the didactic training session on BSP, Paraeducator B's rate of BSP increased from zero in baseline to five in session nine and 10. Upon obtaining a rate of five BSPs in session 10, a downward trend followed in sessions 11 and 12, then a slight increase to five occurrences of BSP occurred during session 16, followed by another slight downward trend again in sessions 17-21 (M = 3.67). None of the BSP data points overlapped with the BSP data points in baseline, resulting in a slightly higher level in the intervention condition. The BSP mean increased from zero in baseline to 3.7 in intervention. Further, there were no instances of overlap between BSP and Performance Feedback/OTR (0%) during intervention, nor between BSP and Control/EIC (0%).

Control/EIC During the intervention phase Paraeducator B demonstrated minimal to no use of EIC. Four occurrences of EICs were demonstrated across nine sessions (M = .4). Five of the nine EIC intervention data points (55%) overlapped with the EIC data points in baseline, resulting just a slightly higher level of EIC in intervention. The EIC mean increased from zero in baseline to .4 in intervention. Further, there were no instances of overlap between EIC and Performance Feedback/OTR (0%), nor between EIC and Didactic Instruction/BSP (0%) during the intervention condition.

4.1.2.3 Maintenance

Maintenance data were collected at seven, 13, 18, 22, and 25 days after the conclusion of the intervention phase.

Performance Feedback/OTR During Paraeducator B demonstrated an increasing trend for OTR during the maintenance condition, starting with 14 occurrences during session 28, then increasing to 39 occurrences during session 39, and followed by 28 occurrences during session

43 and 35 occurrences during session 47 (M = 27.6). No OTR maintenance data points overlapped with OTR baseline data points, while two out of five of the OTR maintenance data points (40%) overlapped with OTR intervention data points. The remaining three OTR maintenance data point were higher than the OTR data points in intervention, with OTR maintenance data ranging from 13 to 39. Further, there were no instances of overlap between OTR and Didactic Instruction/BSP (0%) nor between OTR and Control/EIC (0%) during maintenance. There were also no instances of overlap between OTR maintenance data and Didactic Instruction/BSP intervention data (0%), nor between OTR maintenance data and Control/EIC intervention data. (0%). Paraeducator B's mean score for OTR increased from 0 during baseline to 13.7 during interventions and again to 27.6 during maintenance.

Didactic Instruction/BSP During maintenance Paraeducator B continued to use BSP minimally. One out of the five sessions (20%) showed no uses of BSP and the remaining four BSP maintenance data points showed only three occurrences at most per session (M = 2). The level of BSP during maintenance was just slightly higher than the BSP baseline level and slightly lower then the BSP intervention level. Of the five BSP maintenance data points, one overlapped with the BSP baseline data (20%) and all five overlapped with the BSP intervention data point (100%). Further there were no occurrences of overlap between BSP maintenance data and Performance Feedback/OTR intervention data (0%), while one BSP maintenance data point overlapped with Control/EIC intervention data (20%). Paraeducator B's mean score of BSP increased from 0 during baseline to 3.67 during interventions and then decreased to 2 during maintenance.

Control/EIC The EIC level during maintenance was slightly higher than the EIC baseline level and similar to the EIC intervention level. The maintenance data demonstrated minimal to

no occurrences of EIC, with only one EIC demonstrated during session 47 (*M* = .2). All five EIC maintenance data points overlapped with EIC intervention data (100%). One instance of overlap was shown between EIC and Didactic Instruction/BSP during the maintenance condition (20%), while no instances of overlap occurred between EIC maintenance data and Performance Feedback/OTR maintenance data (0%). Further, there were no instances of overlap between EIC maintenance data and Didactic Instruction/BSP intervention data, nor between EIC maintenance data and Performance Feedback/OTR intervention data. Paraeducator B's mean score of EIC increased from 0 during baseline to .4 during interventions and then decreased to .2 during maintenance.

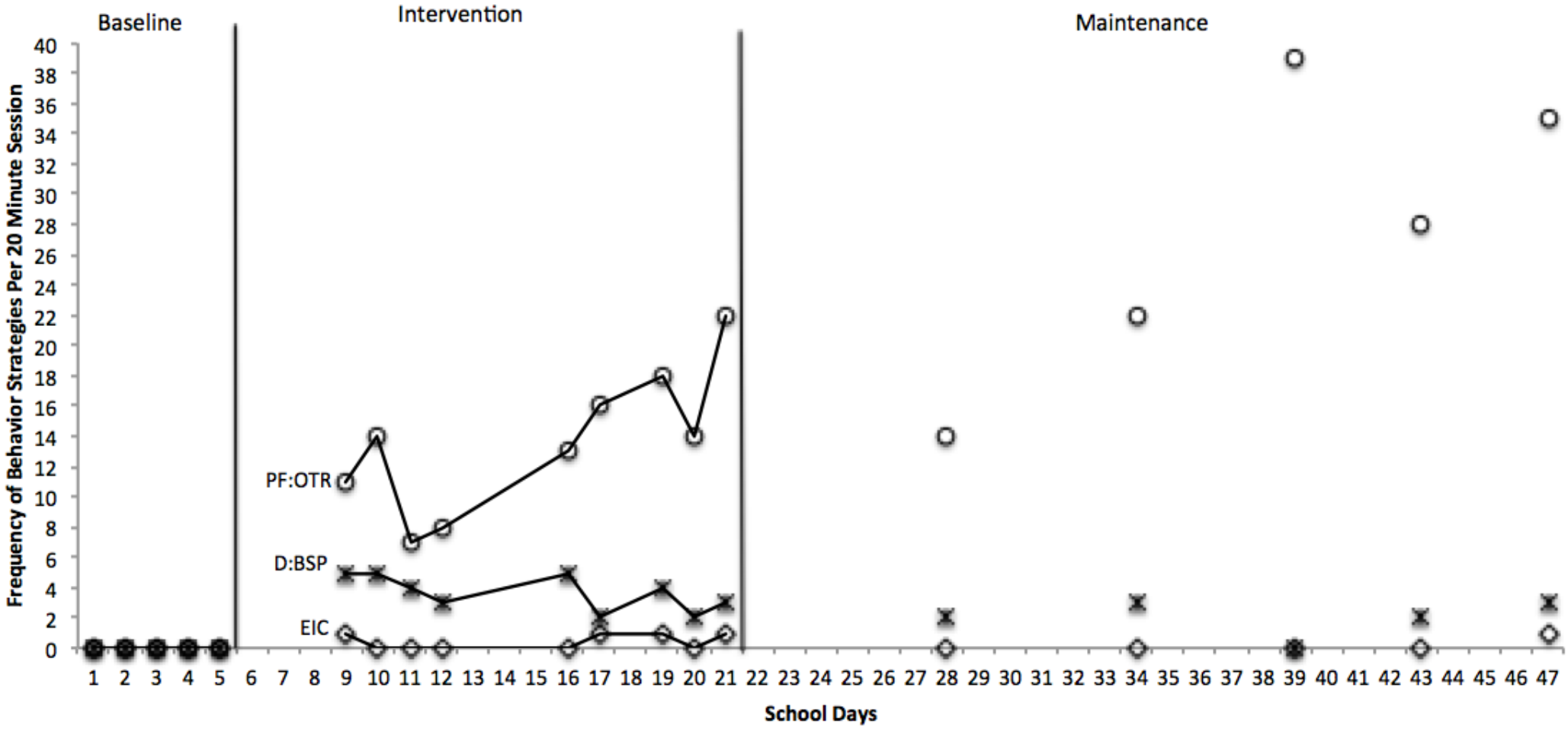

Figure 2. *Frequency of Positive Behavior Support Strategies for Paraeducator B.*

Note: *PF:OTR*- Performance Feedback on Opportunities to Respond, *D:BSP*- Didactic Instruction on Behavior Specific Praise, and *EIC*- Control Condition with Effective Instruction and Commands

4.1.3 Paraeducator C

Paraeducator C provided support to seven students with disabilities in a fourth grade social studies elementary inclusive classroom. She participated in the didactic instruction training session on OTR and she received performance feedback on BSP. The results of Paraeducator C's performance are displayed in Figure 3.

4.1.3.1 Baseline

Due to two schedule conflicts and one technology issue, Paraeducator C was limited to two baseline observations sessions. In baseline Paraeducator C demonstrated minimal to no use of BSP (M = 0), EIC (M = 0), and OTR (M = .5). Information pertaining to Paraeducator C's limited baseline data is discussed further in the limitations section of this paper.

4.1.3.2 Intervention

Performance Feedback/BSP Upon introduction of performance feedback, BSP immediately increased from zero in baseline to seven in session nine and six during session 10. Once reaching six during session 10 the frequency of BSP increased to 19 during session 11, then slightly decreased 13 during session 12, followed by an upward trend reaching 21 during session 14. A slight decrease occurred during session 15 and 16 with 18 occurrences and slight increase ended the phase with 21 occurrences of BSP during session 18. An increasing trend was demonstrated throughout the intervention phase with one substantial increase between session 10 and 11. Paraeducator C's use of BSP maintained at a higher level in the intervention phase (M = 15.4) than in baseline (M = 0), with the frequency of BSP ranging from 6-21. There was no overlap between BSP intervention performance and BSP baseline performance (0%), resulting in

a much higher level during intervention. The BSP mean increased from zero in baseline to 15.4 in intervention. Further, there were no instances of overlap between BSP and Control/EIC (0%) during the intervention condition and only two instances of overlap between BSP and Didactic Instruction/OTR (22%).

Didactic Instruction/OTR Upon completing the didactic training session on OTR, Paraeducator C's rate of OTR increased from zero in baseline to three in session nine. The remaining eight intervention OTR data points show a slight increasing trend and some variability, with data ranging from one occurrence to 10 occurrences (M = 5.3). The OTR level in intervention is slightly higher than the OTR level in baseline, with only one of the nine intervention data points (11%) overlapped with the data points in baseline. The OTR mean increased from .5 in baseline to 5.3 in intervention. Further, there were four instances of overlap between OTR and Performance Feedback/BSP (44%) during the intervention condition and six occurrences of overlap and between OTR and Control/EIC (66%).

Control/EIC During the intervention phase Paraeducator C showed a slight increase in her use of EIC, with EIC data ranging from zero to three across the nine data points (M = 1.55). Three EIC data points overlapped with the EIC data points in baseline (33%), resulting in a slightly higher level of EIC in intervention. The EIC mean increased from zero in baseline to 1.6 in intervention. Further, six of the nine EIC data points overlapped with the Didactic Instruction/OTR data points (66%) during intervention, while there no occurrences of overlap between EIC and Performance Feedback/BSP we demonstrated (0%).

4.1.3.3 Maintenance Maintenance data was collected five, 11, 17, 21, and 22 days after the conclusion of the intervention phase. Data was collected during two consecutive sessions

towards the latter part of week four during maintenance due to a technology issue during the final week.

Performance Feedback/BSP During the maintenance condition Paraeducator C demonstrated a slight downward trend and some variability (range = 12-22) with her disclosing that she was not feeling well during session 29. However, she continued to deliver a moderate to high rate of BSP, with 22 occurrences during session 25, 12 during session 29, 19 during session 35, 17 during session 39 and 12 during session 40 (M = 16.4). The level of BSP during maintenance was similar to the BSP level during intervention, staying significantly higher than baseline. No maintenance BSP data points overlapped with BSP baseline data points (0%), while all of the BSP maintenance data points (100%) overlapped with the intervention BSP data points. Further, there were no instances of overlap between BSP maintenance data and Didactic Instruction/OTR maintenance data (0%), nor between BSP maintenance data and Control/EIC maintenance data (0%). There was also no overlap between BSP maintenance data and Didactic Instruction/OTR and Control/EIC intervention data. Paraeducator C's mean score of BSP increased from 0 during baseline to 15.4 during intervention and then increased to 16.4 during maintenance.

Didactic Instruction/OTR During maintenance Paraeducator C continued to use OTR at a steady minimal rate, with a slightly lower level than the OTR intervention level. Paraeducator C had one occurrence of OTR during session 25, two occurrences during session 29, five during session 35 and two during session 40 (M= 2). All of the OTR maintenance data points (100%) overlapped with OTR intervention data, while two data points overlapped with OTR baseline data (40%). Further, none of the OTR maintenance data points overlapped with Performance Feedback/BSP maintenance or intervention data. Only one OTR maintenance data point

overlapped with the EIC maintenance data (20%), while four out of five of the maintenance OTR data points overlapped with intervention EIC data (80%). Paraeducator A's mean score of OTR increased from 0 during baseline to 5.3 during interventions and then decreased to 2 during maintenance.

Control/EIC During maintenance Paraeducator C did not demonstrate any correct uses of EIC. The level for EIC during maintenance and the same as the EIC level during baseline, with no occurrences of EIC ($M = 0$). All of the EIC maintenance data points overlapped with both EIC baseline data (100%) and EIC intervention data (100%). Further, there were no occurrences of overlap between the EIC maintenance data and Performance Feedback/BSP maintenance data (0%) and one instance of overlap between EIC maintenance data and Didactic Instruction/OTR maintenance data (20%). There were not instances of overlap between EIC maintenance data and both Didactic Instruction/OTR intervention data and Performance Feedback/BSP intervention data. Paraeducator C's mean score of EIC increased from zero during baseline to 1.55 during intervention and then decreased back to zero during maintenance.

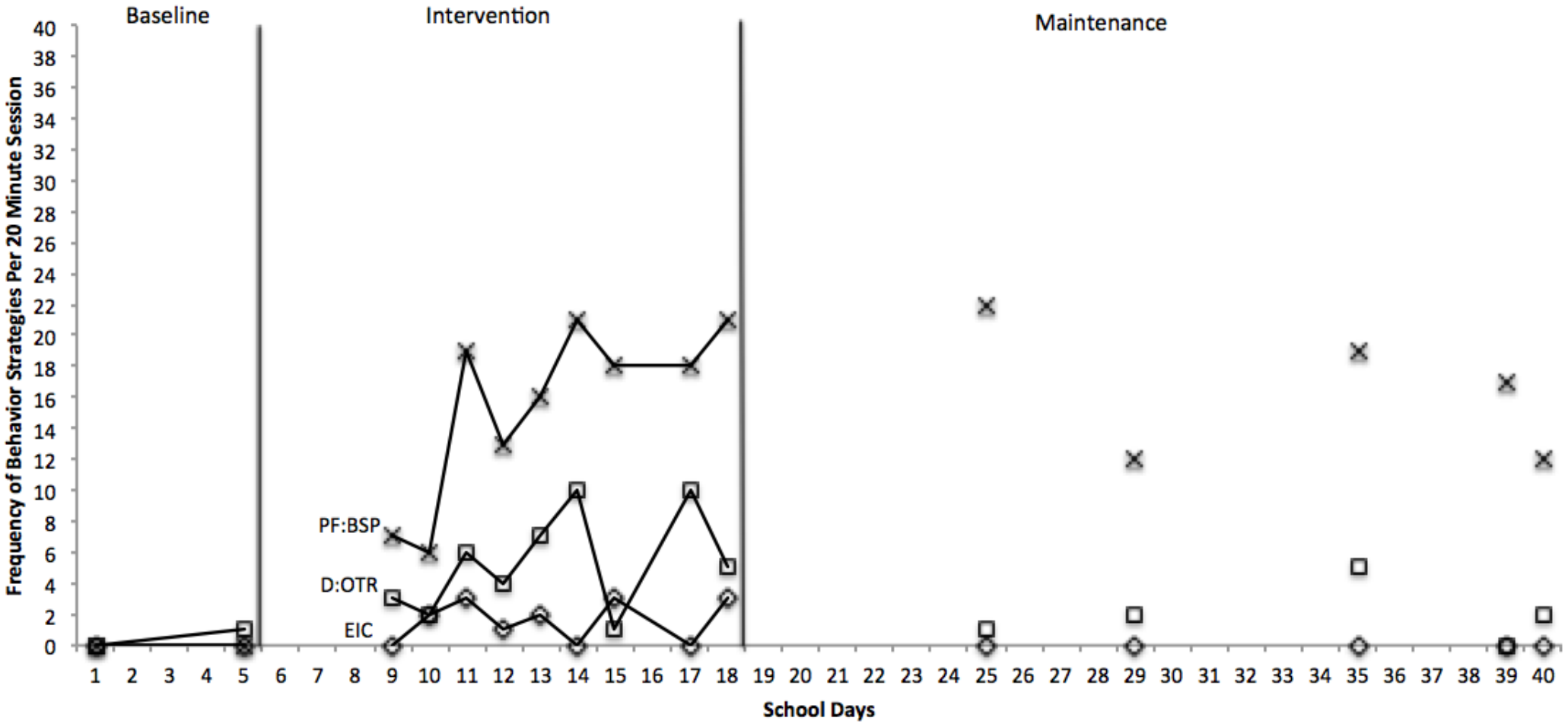

Figure 3. *Frequency of Positive Behavior Support Strategies for Paraeducator C.*

Note: *PF:BSP*- Performance Feedback on Behavior Specific Praise, *D:OTR*- Didactic Instruction on Opportunities to Respond, and *EIC*- Control Condition with Effective Instruction and Commands

4.1.4 Paraeducator D

Paraeducator D provided support to two students with disabilities in a fifth grade science elementary inclusive classroom. She participated in the didactic instruction training session on BSP and she received performance feedback on OTR. The results of Paraeducator D's performance is displayed in Figure 4. Due to a technology issue, session 13 was only 15 minutes in duration.

4.1.4.1 Baseline During baseline Paraeducator D consistently demonstrated minimal to no use of effective OTR (M = 0), BSP (M = 0), and EIC (M = .6) across five observation sessions. The rate of responding was low and stable across all three DVs.

4.1.4.2 Intervention

Performance Feedback/OTR Upon introduction of performance feedback, Paraeducator's use of OTR immediately increased from zero in baseline to 15 in session 10. The frequency of OTR slightly decreased during sessions 11 and 12, but then continued with an increasing trend steadily over the next several sessions reaching 34 during session 17 and concluding the intervention phase with 25 occurrences during session 18. Paraeducator D's use of OTR maintained at a much higher level in the intervention phase (M = 18) than in baseline (M = 0), with the frequency of OTR ranging from 7-34. There was no overlap between OTR intervention performance and OTR baseline performance, resulting in a much higher level within intervention. The OTR mean increased from zero in baseline to 18 in intervention. Further, there were only two instances of overlap between OTR and Didactic Instruction/BSP (22%) and no instances between OTR and Control/EIC (0%) within the intervention condition.

Didactic Instruction/BSP Upon completing the didactic training session on BSP, Paraeducator D's rate of BSP increased from zero in baseline to 10 in session 10. Once reaching a rate of 10 BSPs during session 10, a steady downward trend followed in all subsequent sessions, reaching zero in session 18 (M = 5.2). One BSP intervention data point overlapped with the BSP baseline data points (11%). The BSP mean increased from zero in baseline to 5.2 in intervention. Further, there were four instances of overlap between BSP and Performance Feedback/OTR (44%) and five occurrences of overlap between BSP and EIC during the intervention condition (55%).

Control/EIC During intervention Paraeducator D demonstrated some improvement in her use of EIC. Within each session data ranged from one to six EIC, (M = 3.6) resulting in a slightly higher level than the EIC baseline level. Three EIC intervention data points (33%) overlapped with the EIC data points in baseline. The EIC mean increased from .6 in baseline to 3.6 in intervention. All of the EIC intervention data points overlapped with the Didactic Instruction/BSP data points in intervention (100%), while no occurrences of overlapped were shown between EIC and Performance Feedback/OTR (0%).

4.1.4.3 Maintenance Maintenance data was collected seven, 13, 20, 23, and 26 days after the conclusion of the intervention phase.

Performance Feedback/OTR During the maintenance condition Paraeducator D demonstrated a slight downward trend, but still engaged in a high rate of OTR. Data decreased from 39 occurrences of OTR during session 25 to 23 occurrences during session 38, then steadily increased to 28 during session 41 and 29 during session 44 (M = 31). No OTR maintenance data points overlapped with OTR baseline data points (0%), while three out of five of the OTR

maintenance data points (60%) overlapped with the intervention OTR data points. The remaining two OTR maintenance data point were higher than the OTR data points in intervention, with maintenance data ranging from 23 to 39. Further, there were no instances of overlap between OTR and Didactic Instruction/BSP nor between OTR and Control/EIC during maintenance. Paraeducator D's mean score for OTR increased from 0 during baseline to 18 during interventions and again to 31 during maintenance.

Didactic Instruction/BSP During maintenance three out of the five sessions (60%) showed no uses of BSP while the remaining two maintenance data points showed only three occurrences collectively (M = .6). The level of BSP during maintenance was similar to the baseline BSP level and the latter BSP data points during intervention. Three out of five of the BSP maintenance data points (60%) overlapped with both BSP baseline and intervention data. Further, there were no instances of overlap between BSP maintenance data and Performance Feedback/OTR intervention data (0%) and two instances of overlap between BSP maintenance data and Control/EIC intervention data (40%). Paraeducator D's mean score of BSP increased from 0 during baseline to 5.2 during interventions and then decreased to .6 during maintenance.

Control/EIC During maintenance Paraeducator D's use of EIC decreased and a slight downtrend was demonstrated. There were five occurrences of EIC during session 25, three during sessions 31 and 38, one during session 41 and two during session 44 (M = 1.8). The level of EIC during maintenance was slightly higher than baseline and slightly lower than intervention. All of the EIC maintenance data overlapped with the EIC intervention data (100%). Although only one of the five EIC maintenance data points overlapped with Didactic Instruction/BSP maintenance data (20%), all five EIC maintenance data points did overlap with Didactic Instruction/BSP intervention data (100%). There were not instances of overlap between EIC

maintenance data and Performance Feedback/OTR intervention or maintenance data (0%). Paraeducator D's mean score of EIC increased from .6 during baseline to 3.6 during intervention, and then decreased to 1.8 during maintenance.

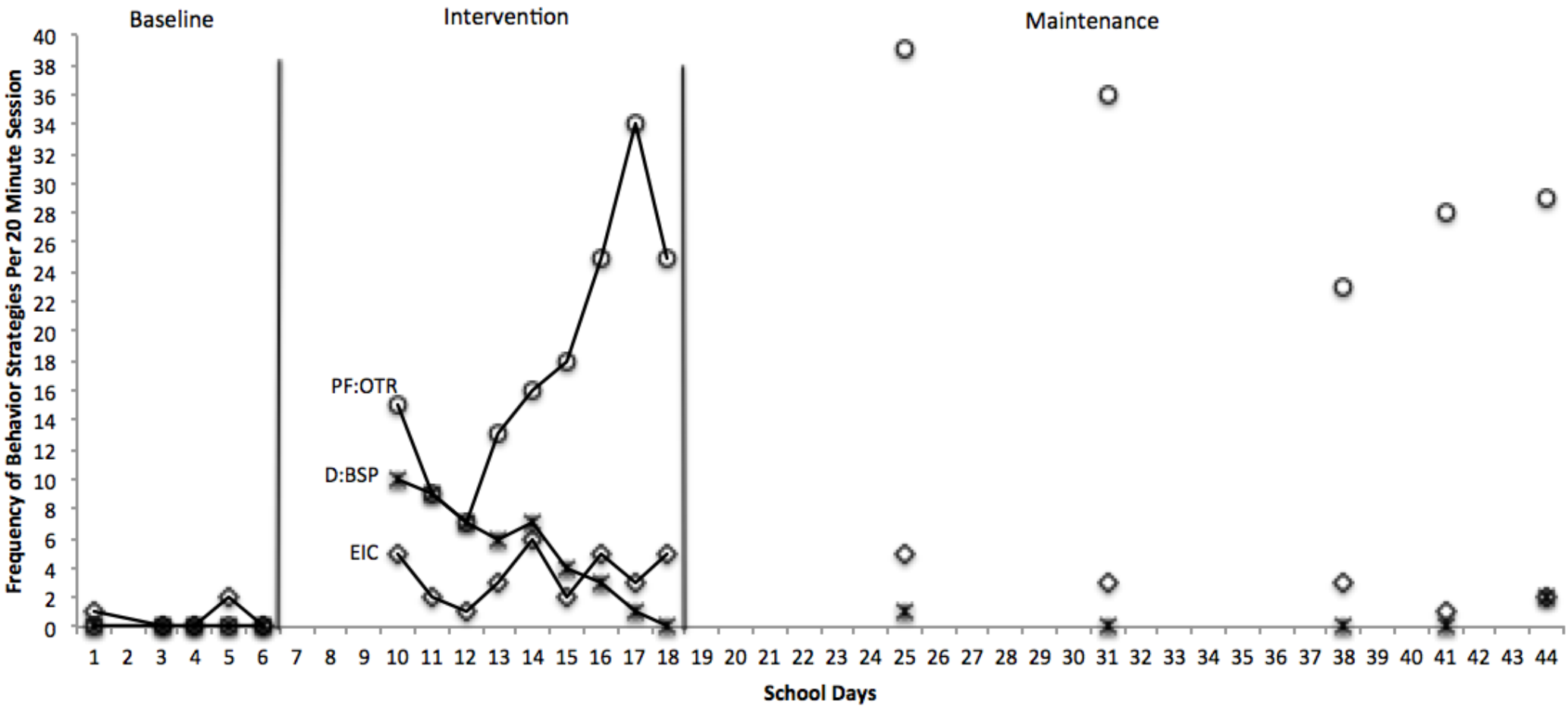

Figure 4. *Frequency of Positive Behavior Support Strategies for Paraeducator D.*

Note: *PF:OTR*- Performance Feedback on Opportunities to Respond, *D:BSP*- Didactic Instruction on Behavior Specific Praise, and *EIC*- Control Condition with Effective Instruction and Commands

4.1.5 Social Validity

Social validity data was collected from both the paraeducators and the classroom teachers. The paraeducators completed a 13 statement 5-point Likert scale questionnaire (e.g., strongly disagree, disagree, neutral, agree, strongly agree) with an additional five open-ended questions. The classroom teachers, who were blind to the DVs in the study, completed a 13 statement 5-point Likert scale questionnaire with two additional open-ended questions. Average scores across paraeducators appear in Table 13 and average scores across classroom teachers appear in Table 14.

Feedback provided by the paraeducators indicated that although they found the didactic instruction session to be helpful learning and maintaining the new strategies (M = 3.75, M = 3.25), they felt performance feedback was more beneficial in both learning and maintaining the strategies (M = 4.75, M = 5). Further, when asked about which training approach they would like to continue to have as a primary means of professional development the paraeducators tended to prefer performance feedback (M = *4.5*) over didactic instruction (M = 3.5). All four paraeducators felt that they found themselves using one strategy more often then the other (M = 4.75) and all paraeducators indicated the strategy they used more was the strategy taught using performance feedback. Relative to the positive behavior support strategies, the paraeducators seemed to feel that learning the strategies did not take up too much of their time (M = 4.25), were easy to implement (M = 4.25) and helpful when supporting students with disabilities in inclusive classrooms (M = 4.5). Although the paraeducators felt that implementing the strategies may have made it a little more difficult to focus on their other responsibilities (M = 3.5), they do plan to continue to use the new strategies they learned (M = 4). All four paraeducators indicated that they preferred performance feedback over didactic instruction. The paraeducators reported that

the feedback was most helpful because it was immediate (N = 3) and because it provided them with specific ways to improve their performance (*N* = 3). Specific components of the trainings that the paraeducators felt were most beneficial included the performance feedback (*N* = 4) and being shown the graphical display of their performance during the feedback sessions (*N* =1). In regard to components of the trainings that were least helpful, one paraeducator reported that she felt the didactic training seemed to cover a lot of information in a short time and that the five minute performance feedback session sometimes caused her to miss time with her students. Each paraeducator reported that their skills have grown as a product of the trainings and the newly learned strategies have been very helpful. They also commented that they started to use these strategies with other students in other classrooms. Overall, the paraeducators in this study felt that the didactic training was somewhat helpful, but moving forward they would like to see performance feedback incorporated into future training opportunities.

Table 13. *Paraeducator social validity mean scores.*

	Mean (N=4)
Effect of Training:	
1. I felt the didactic instruction session helped me to learn the strategy.	3.75
2. I felt the didactic instruction session helped me to maintain my use of the strategy.	3.25
3. I felt the performance feedback sessions helped me to learn the strategy.	4.75
4. I felt the performance feedback session helped me to maintain my use of the strategy.	5
Ease of Use of Strategies:	
5. I found the strategies to be easy to learn and implement.	4.25
6. I found the strategies to be helpful when working with students with disabilities in inclusive classrooms.	4.5
Overall Opinion of Trainings and Strategies:	
7. I enjoyed learning new strategies and implementing them with the students I work with.	4.25
8. I would like to continue to receive didactic instruction as a primary means of professional development moving forward.	3.5
9. I would like to continue to receive performance feedback as a primary means of professional development moving forward.	4.5
10. I think I will continue to use the strategies I learned with my students in the future.	4.75
Time/Burden Associated with Trainings and Strategies:	
11. Learning the strategies did not take up too much of my time.	4.25
12. Using the strategies did not interfere with my other responsibilities.	3.5
Maintenance of the Strategies:	
13. Upon completing both trainings I find myself continuing to use the strategies in the manner I was trained.	4
14. Upon completing both trainings I find myself using one strategy more than the other.	4.75

Information provided by the classrooms teachers indicated that, in general, they noticed a difference in the way the paraeducators interacted with the students (*M* = 4.25). Two of the classroom teachers noted that they did not see an increase in the frequency of the paraeducators involvement with the students (*M* = 3.25). One of these two teachers commented that the paraeducator had always had a lot of interaction with the students and, therefore, she did not see an increase in these interactions, but rather the quality of the interactions improved, while the other teacher felt the paraeducator had a similar number of student interactions before and during the study. The classroom teachers reported that they did observe the paraeducator using more BSP (*M* = 4.5) and OTR (*M* = 4) and appeared to not have much difficulty doing so (*M* = 4.5). One classroom teacher did share that although she noticed an increase in the amount of BSP being delivered, she did not observe the paraeducator delivering more thought-provoking questions. All of the teachers stated that the paraeducator interacting with the students did not disrupt their teaching (M = 4.5) and felt that the paraeducator learned something new from the trainings (*M* = 4.75). Although three teachers shared they were in favor of paraeducators being trained more, when asked if they were excited to learn that their paraeducator was going to be provided with training two teachers reported that they felt neutral about this, while the other two teachers agreed that they were excited. Lastly, when asked about whether or not they noticed the paraeducator continuing to interact more with the students upon completion of the two trainings two teachers strongly agreed that they noticed continued increased interactions, one teacher agreed, and one teacher reported feeling neutral (*M* = 4.25).

Table 14. *Teacher social validity mean scores.*

	Mean (N=4)
Effect of Training:	
1. I noticed a difference in the way the paraeducator interacted with the students throughout the course of the study.	4.25
2. I observed the paraeducator being more involved and talking more with the students.	3.25
3. I observed the paraeducator delivering more behavior specific praise.	4.5
4. I observed the paraeducator asking more thought-provoking questions.	4
Ease of Use of Strategies:	
5. It did not appear as though the paraeducator was having difficulty implementing the newly presented strategies.	4.5
6. The paraeducator did not require any additional materials or guidance from me in order to implement the strategies.	4.75
Overall Opinion of Trainings and Strategies:	
7. I was excited to hear that the paraeducator was going to be getting training specifically designed for him/her.	3.75
8. I think it is good that the paraeducator was given performance feedback.	4.5
9. I am in favor of providing paraeducators with more training.	4.25
10. It seems as though the paraeducator learned something new from the training.	4.75
Time/Burden Associated with Trainings and Strategies:	
11. The paraeducator did not miss much class time in order to learn the strategies.	4.75
12. The paraeducators interactions with the students did not disrupt my teaching.	4.5
Maintenance of the Strategies:	
13. Upon completing both trainings I noticed that the paraeducator continued to interact more frequently with the students.	4.25

5.0 DISCUSSION

The focus, both in legislation and in school practice, on providing services to students with disabilities in inclusive settings, has dramatically redefined the role of paraeducators who provide support services (Hall et al., 2010). As paraeducators assume more responsibility within inclusive environments, concerns have emerged in the field as to whether the increase and change in responsibility is matched with appropriate training. With such a limited amount of experimental paraeducator training research (Brock & Carter, 2013) researchers must rely on the implications derived from the teacher training literature base. Within this research base two training approaches have been examined extensively: didactic instruction and performance feedback. With teachers, didactic instruction has been shown to produce limited effects on newly acquired skills (Hans & Weiss, 2005) while training practices that included performance feedback have shown promising effects (Hawkins & Heflin, 2011). Therefore, the purpose of this research study was to examine the effects of two of the most prominent teacher training approaches (e.g., didactic instruction and performance feedback) on paraeducators use of positive behavior support strategies in inclusive settings.

5.1.1 Didactic Instruction

The first research question sought to examine the immediate and sustained effects of didactic instruction on the paraeducators' use of the positive behavior support strategies: 1. What effect does didactic instruction have on paraeducators' use of positive behavior support strategies? The results of the current study showed that the didactic instruction training session did have some effect on the paraeducators use of positive behavior support strategies. Upon completion of the didactic instruction session all four paraeducators experienced an increase in their performance to a slightly higher level than baseline. However, three of the four paraeducators demonstrated a decreasing trend immediately following the initial increase (Paraeducator A, B, and D), while one paraeducator (Paraeducator C) continued to exhibit variable performance on post didactic training measures. From baseline to intervention the DVs taught using didactic instruction had a mean increase of only four occurrences (range = 1.67-5.33) across all four paraeducators. This may suggest that although didactic instruction produces some immediate behavior change, it does not result in sustained improvement. The paraeducators performance during maintenance also supports this notion as the didactic instruction data during the maintenance phase shows that all four paraeducators continued to perform at a similar or lower level compared to the intervention phase. These findings support the work of Hans and Weiss (2005) who found that didactic instruction alone does not produce sustained effects.

5.1.2 Performance Feedback

The second research question sought to examine the immediate and sustained effects of performance feedback on the paraeducators' use of the positive behavior support strategies:

What effect does performance feedback have on paraeducators' use of positive behavior support strategies? The results of the current study demonstrated a clear experimental effect between performance feedback and the paraeducators' use of the positive behavior support strategies. The data specific to performance feedback supports the findings of Robinson (2011) by demonstrating a substantial improvement in performance as a result of a training program that relied on performance feedback.

All four paraeducators experienced a considerable increase in performance across both OTR and BSP after receiving a 10-minute strategy review and several sessions of performance feedback. From baseline to intervention a mean increase of 15 occurrences (range = 12.5-18) was noted across all four paraeducators. Further, paraeducators continued to use the strategy taught using performance feedback at a similar or higher level during maintenance. This may suggest that performance feedback not only helps support immediate behavior change, but sustained behavior change as well. It also suggests that while there was a little overlap, the DVs were functionally independent to a large degree, supporting the findings of the task similarity analysis and strengthening the internal validity of the study.

5.1.3 Control Condition

Within this study the control condition served to examine the effects of the absence of training. During baseline, all four paraeducators had minimal to no EICs and during intervention all four paraeducators experienced only a slight increase in level possibly due to some overlap within the DVs. Although the DVs were functionally independent from one another, several of the steps to complete the strategy were similar. Table 10 outlines these similarities and differences. For example, OTR, BSP, and EIC all required that the paraeducator gain the student's attention prior

to implementing the specific strategy and that the paraeducator gives a minimum of three seconds of wait time. Being that the paraeducators were given didactic instruction and performance feedback on gaining a student's attention effectively and delivering wait time, they could have unknowingly generalized these steps to EIC, resulting in an increased rate of EIC. Although there was a slight increase in EIC during intervention, it was minimal and the lowest level increase compared to didactic instruction and performance feedback. This may suggest that if no training is provided to paraeducators they will continue to not implement evidence-based practices, or implement these practices minimally.

5.1.4 Comparisons Across IVs

The third research question evaluated the difference in paraeducators' immediate and sustained use of positive behavior support strategies when trained using didactic instruction versus performance feedback: Is there a difference in paraeducators' immediate and sustained use of positive behavior support strategies when trained using didactic instruction or performance feedback? Comparatively examining the data across IVs reveals that performance feedback was the superior training approach for these four paraeducators. Performance feedback consistently outperformed didactic instruction across all four paraeducators and across both DVs. All four performance feedback levels were consistently higher than the didactic instruction levels throughout the intervention phase, with minimal overlap, indicating that performance feedback had a stronger immediate effect on paraeducator performance. Also, all four paraeducators demonstrated an increasing trend associated with the strategy taught using performance feedback, while the strategy taught using didactic instruction had a either a decreasing trend (Paraeducator A, B, and D) or variable data (Paraeducator C). This remained true within the

maintenance phase of the study as all four paraeducator maintained their use of the strategies taught through performance feedback at a higher level than those strategies taught using didactic instruction.

Further, the DV taught using performance feedback always outperformed the DV taught using didactic instruction suggesting that the difficulty of the DVs was equivalent. If one DV was easier to implement than the others, then the data may have shown the easier DV being used at a higher frequency across all for paraeducators regardless of the IV being implemented. Each paraeducator demonstrated three distinct levels of performance, with the DV taught using performance feedback always at the highest level, upholding the findings of the task similarity analysis and strengthening the internal validity of the study.

When comparing the paraeducators' performance across IVs It is also important to consider the amount of time the paraeducators were engaged in direct instruction with the PI. Although time was controlled for in terms of the amount of time needed to employ the strategies, there was a difference in the amount of time the paraeducators were engaged in direct instruction. For example, the didactic instruction session required the paraeducators to engage in 180 minutes of direct instructional time with the PI, while the performance feedback approach required only 55 minutes. For example, during the performance feedback strategy, paraeducators only engaged in direct instruction when the PI completed the 10-minute strategy review and when the five minutes of feedback were given during each performance feedback session. The remainder of the performance feedback approach consisted of nine 15-minute observations, where the paraeducators were not engaged in direct learning with the PI. Although the paraeducators engaged in an additional 125 minutes of direct instruction with the didactic training, they still performed significantly lower on the DV associated with didactic instruction than they did the DV taught using performance feedback. Therefore, not only did performance

feedback produce better outcomes, but it did so with much less instructional time. This also suggests that performance feedback is both more effective and more efficient than didactic instruction.

5.1.5 Limitations

Despite demonstrating an experimental effect, the study does have limitations. First, due to various technology difficulties, one paraeducator only had two data points during baseline. Although five data points, or evidence of stable responding (Horner et al., 2005; Kratochwill et al., 2010), is ideal, the PI felt that it was in the best interest of the participant, and the study, to move her into the intervention phase in order to have her participate in the didactic instruction training session with her peers. As mentioned in the procedures, the didactic instruction training experience for each participant was designed to mimic that of a large group typical in-service training session and withholding that experience from Paraeducator C could have impeded her ability to experience the session as it was intended to be experienced. For example, having Paraeducator C participant in a one-on-one didactic training does not mimic a usual in-service training, as school districts usually do not give individual presentations to staff members. It also would have been difficult to compare her results to others. Further, being that the baseline condition is not a necessary component of an AATD (Holcombe, Wolery, & Gast, 1994) and that it primarily serves to demonstrate the task equivalence of the DVs by showing the paraeducators' use of each DV prior to intervention (Sindelar, Rosenburg, & Wilson, 1985), and because the increase in Paraeducator C's DVs was minimal (range = 0-1), the PI felt it was more beneficial for her to move into intervention.

Additionally, technology issues may have also prevented some occurrences of the DVs from being coded. At times the microphone on the paraeducator contained some static or was turned down low making if difficult for the coder to hear what was occurring. Although this was a rare occurrence, there may have been some instances where an occurrence of a DV was missed due to technology issues.

Second, OTRs were coded as questions only. Questions are one form of an OTR within an umbrella of varying types of OTR. Therefore, some opportunities for students to respond may not have been represented in the paraeducators' data.

5.1.6 Implications for Practice

The current study demonstrated the importance of incorporating performance feedback when training paraeducators who work in inclusive settings. All four paraeducators experienced a significant level of improvement with the DV trained using performance feedback. Although additional studies are needed to replicate these findings, the results of this study suggest that when training paraeducators on new skills performance feedback may produce better immediate and sustained effects than didactic instruction alone. With time being controlled throughout the study (i.e., 180 minutes of each training approach), it may also be important for school leaders to consider how professional development time is best planned for and executed. With each training approach requiring 180 minutes, and with performance feedback outperforming didactic instruction considerably, it may be beneficial for school leaders to consider how to incorporate opportunities for paraeducators to be given performance feedback. Although the cost and time needed for individual performance feedback may be considerably higher than large-group didactic instruction, the data from this study demonstrated no sustained change in paraeducator

behavior over time under the didactic instruction condition. Therefore, it is important to understand that although large-group didactic instruction may be an efficient way to train paraeducators in terms of time and cost, it may not be effective in producing sustained behavior change, leaving the overall value of the training questionable.

5.1.7 Future Directions for Research

The current literature base on paraeducator training focused predominantly on teaching paraeducators individualized student strategies, based on students' needs, through didactic instruction. Further, the literature also favored paraeducators who work in a special education classroom or school. The current study supports and extends the work of Causton-Theoharis and Malmgren (2005), Feldman and Matos (2013), Robinson (2011) and Toelken and Miltenberger (2012) by moving beyond individualized strategies, focusing specifically on paraeducators who work in inclusive environments, and comparing the effects of both didactic instruction and performance feedback. However, although performance feedback appears to be the superior training approach, examining the feasibility and sustainability of a performance feedback training program for paraeducators should be a priority. Researchers need to determine if performance feedback can be delivered less frequently or in a cost-effective way (e.g., small groups, through technology) and still maintain the same level of effectiveness. For example a Multiple Baseline Across Participants Design (MBL) could be conducted that evaluates the effects of a performance feedback training program on paraeducators' use of one targeted positive behavior support strategy, with four performance feedback sessions over the course of four months (i.e., monthly feedback sessions) using video observations and e-mail feedback.

This study design would allow researchers to determine if a schedule-friendly and cost-effective performance feedback is just as beneficial.

A cost-to-benefit assessment provides another avenue for future research. With the results of the current study supporting many of the findings in teacher training literature base (Duchaine et al., 2011; Hawkins & Heflin, 2011), that performance feedback produces positive outcomes, it will be necessary to determine whether or not the benefits of such training outweigh the associated costs. Considerations need to be made for the time and costs associated with observing and delivering performance feedback, traveling to school sites, and personnel needed to execute the training. Alternatively, considerations need to also be made for the benefits of PF, such as paraeducator performance, the generalizability of the newly acquired skills, the effect their performance has on student behavior, and the versatility the paraeducator brings to the district with an improved or expanded skillset.

In the current study classroom teachers were only minimally involved in the study. Extending the performance feedback training approach to include classroom teachers alongside the paraeducators would be a good way to begin to strengthen the inclusive classroom partnership that Jones and colleagues (2012) allude to in their research. Providing performance feedback to paraeducator and classroom teacher dyads would not only allow for both individuals to improve their skillsets, but it may also serve to improve the working relationship and lack of appreciation that many paraeducators feel (Fisher & Pleasants, 2012; Sobeck & Robertson, Under Review). Providing this type of training to teacher and paraeducator dyads may also serve to bring more consistency to the overall classroom management plan. For example, a Multiple Baseline Across Behaviors Design (MBL) that evaluates the effects of a performance feedback training program on a paraeducator and teacher dyad's use of one targeted classroom management strategy, with four performance feedback sessions over the course of four months

(i.e., monthly feedback sessions) using video observations and face-to-face performance feedback sessions.

5.1.8 Conclusions

All four paraeducators in this study experienced greater benefits when being trained using performance feedback than they did being trained with didactic instruction. This study demonstrates that when given 180 minutes of training, paraeducators may tend to have the greatest immediate and sustained performance using performance feedback. Providing evidence that performance feedback is the superior training method adds to the current paraeducator training literature base and also raises the importance of considering the associated gains when planning, allocating funds for, and executing professional development for paraeducators. The results of this study demonstrate an important aspect of training paraeducators that needs to be further examined so that a systematic and effective professional development program for paraeducators who work in inclusive classrooms can be developed and shared.

APPENDIX A

IRB APPROVAL

University of Pittsburgh
Institutional Review Board

3500 Fifth Avenue
Pittsburgh, PA 15213
(412) 383-1480
(412) 383-1508 (fax)
http://www.irb.pitt.edu

Memorandum

To: Emily Sobeck, MEd
From: IRB Office
Date: 12/18/2015
IRB#: PRO15100011
Subject: The Comparative and General Effectiveness of Didactic Instruction and Performance Feedback on Paraeducators' Provision of Positive Behavior Support Strategies in Inclusive Settings

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The above-referenced project has been reviewed by the Institutional Review Board. Based on the information provided, this project meets all the necessary criteria for an exemption, and is hereby designated as "exempt" under section

45 CFR 46.101(b)(1)

Please note the following information:

- Investigators should consult with the IRB whenever questions arise about whether planned changes to an exempt study might alter the exempt status. Use the "**Send Comments to IRB Staff**" link displayed on study workspace to request a review to ensure it continues to meet the exempt category.
- It is important to close your study when finished by using the "**Study Completed**" link displayed on the study workspace.
- Exempt studies will be archived after 3 years unless you choose to extend the study. If your study is archived, you can continue conducting research activities as the IRB has made the determination that your project met one of the required exempt categories. The only caveat is that no changes can be made to the application. If a change is needed, you will need to submit a NEW Exempt application.

Please be advised that your research study may be audited periodically by the University of Pittsburgh Research Conduct and Compliance Office.

Figure 5. *IRB Approval Letter*

APPENDIX B

STUDY MATERIALS

4 Video Cameras
4 Microphone Sets for Camera
1 Video Camera/Microphone Adapters
2 Packs AAA Batteries
4 Video Camera Cases
4 Video Camera Tripods
4 Video Camera Memory Cards
1 External Hard Drive
1 Audio Recorder
Clearances for PI (Child Abuse, FBI, Criminal Background)
Clearances for Research Assistant (Child Abuse, FBI, Criminal Background)
4 Paraeducator Stipends
4 Classroom Teacher Stipends
Research Assistant
Mileage reimbursement for PI & Research Assistant
PowerPoint Presentation
Projector with Audio and Internet Access
Didactic Instruction Folders with Handouts (Copies for 22 attendees)
Didactic Instruction Name Tags
Data Collection Forms
File Sharing Cloud Space (4 Box Accounts for paraeducators, 2 for PI and Assistant)
1 Pair of Headphones
Excel Software for Data Storing and Analysis
Paraeducator Access to a Computer
Strategy Review Handouts

APPENDIX C

STUDY FEEDBACK

Options for statements 1- 13:
[1= strong disagree, 2 = disagree, 3 = Neutral, 4= Agree, 5 = Strongly Agree]

Effects of Trainings:

1. I noticed a difference in the way the paraeducator interacted with the students throughout the course of the study.
2. I observed the paraeducator being more involved and talking more with the students.
3. I observed the paraeducator delivering more behavior specific praise.
4. I observed the paraeducator asking more thought-provoking questions.

Ease of Use of Strategies:

5. It did not appear as though the paraeducator was having difficulty implementing the newly presented strategies.
6. The paraeducator did not require any additional materials or guidance from me in order to implement the strategies.

Overall Opinion of Trainings and Strategies:

7. I was excited to hear that the paraeducator was going to be getting training specifically designed for him/her.
8. I think it is good that the paraeducator was given performance feedback.
9. I am in favor of providing paraeducators with more training.
10. It seems as though the paraeducator learned something new from the training.

Time/Burden Associated with Trainings and Strategies:

11. The paraeducator did not miss much class time in order to learn the strategies.
12. The paraeducators interactions with the students did not disrupt my teaching.

Maintenance of the Strategies:

13. Upon completing both trainings I noticed that the paraeducator continued to interact more frequently with the students

<u>Open-Ended Questions:</u>

14. What are your overall observations in regard to the training the paraeducator received?
15. What are your overall thoughts and opinions in regard to the training the paraeducator received?

APPENDIX D

STUDY FEEDBACK

Options for statements 1- 13:
[1= strong disagree, 2 = disagree, 3 = Neutral, 4= Agree, 5 = Strongly Agree]

Effects of Trainings:

14. I felt the didactic instruction session helped me to learn the strategy.
15. I felt the didactic instruction session helped me to maintain my use of the strategy.
16. I felt the performance feedback sessions helped me to learn the strategy.
17. I felt the performance feedback session helped me to maintain my use of the strategy.

Ease of Use of Strategies:

18. I found the strategies to be easy to learn and implement.
19. I found the strategies to be helpful when working with students with disabilities in inclusive classrooms.

Overall Opinion of Trainings and Strategies:

20. I enjoyed learning new strategies and implementing them with the students I work with.
21. I would like to continue to receive didactic instruction as a primary means of professional development moving forward.
22. I would like to continue to receive performance feedback as a primary means of professional development moving forward.
23. I think I will continue to use the strategies I learned with my students in the future.

Time/Burden Associated with Trainings and Strategies:

24. Learning the strategies did not take up too much of my time.
25. Using the strategies did not interfere with my other responsibilities.

Maintenance of the Strategies:

26. Upon completing both trainings I find myself continuing to use the strategies in the manner I was trained.

Open-Ended Questions:

14. Which training approach did you feel better prepared you to implement the strategy?
15. What component(s) of the trainings did you find to be the most helpful?
16. What component(s) of the trainings did you find to be the least helpful?
17. In what ways do you feel that your skills have grown from participating in this study?
18. Is there anything else you would like to share about your experience with this study?

APPENDIX E

TASK SIMILARITY RUBRIC

Table 15: ***Task Similarity Rubric***

This rubric serves to examine the task similarity and difficulty level between three strategies. Please use the operational definitions of each strategy to answer the following questions.

	OTR	**Effective Instruction/ Commands**	**BSP**
What is the function or purpose of the strategy? (e.g., academic improvement, behavior management)			
What does the topography of the strategy include? (e.g., verbal directive, gestural directive, visual representation, physical redirection)			
Does the strategy require any additional adults aside from the adult implementing the strategy?	Yes No	Yes No	Yes No
In order to implement each strategy are any tangible materials **required**?	Yes No	Yes No	Yes No
Do any of these strategies require the adult to know about upcoming events (i.e., advanced planning)?	Yes No	Yes No	Yes No
Is each strategy considered a "free operant" in that specific environmental conditions do not need to be in place prior to implementation of the strategy?	Yes No	Yes No	Yes No
Is there an equal amount of steps in the sequence for each of these strategies?	Yes No	Yes No	Yes No
Have you identified any meaningful differences between the strategies?	Yes No If yes, please explain:		
Do any of the strategies appear to be more difficult to implement than the others? If so, please describe.	Yes No If yes, please explain:		

APPENDIX F

BSP VIDEO RESPONSE

BSP Video Response 1

1. Praise is most (under/ over) used in both general and special education classrooms.

2. What two "ingredients" are required in BSP?

Ingredient 1: _____
Ingredient 2: _____

3. What is one reason BSP is so effective?

_____
_____

4. What is process praise?

_____

_____

6. Write one BSP statement with a praise phrase and one BSP statement with an approval phrase.

1. _____

2. _____

BSP Video Response 2

1. What is the difference between BSP that focuses on a social behavior and BSP that focuses on an academic task?

   _____

   _____

2. What BSP statements were mentioned throughout the video as the teacher helped the students complete their math tasks? List 2 examples.

   1. _____

   2. _____

3. How does BSP affect a student's confidence during academic work?

   _____

   _____

APPENDIX G

WHAT WENT WRONG?

Directions: Read each scenario, describe what part(s) of delivering an *effective BSP* went wrong, and explain what you would do differently.

Scenario 1:

Mrs. A is a paraeducator in a 10th grade math class. She notices that a student who usually calls out has raised his hand several times to answer class questions. About 20 minutes after the student raised his hand the math teacher directs the students to complete five math problems independently. Mrs. A walks up behind the student's desk and says, "Nice job raising your hand."

What went wrong?	*What would you do differently?*

Scenario 2:

Ms. Ford is a paraeducator in a 3rd grade social studies class. While walking around the classroom and checking in on students, she notices that Michael, who likes to talk to his friend Tom often, has been very focused on his work and has answered almost all the questions. She kneels down, and says, "Wow, Michael, it is nice to see you not talking and finally working quietly like all the other kids."

What went wrong?	*What would you do differently?*

Scenario 3:

Mr. Miller is a paraeducator in Mrs. Johnson's 9th grade geography class. As students work with a partner to label the capital for each state, he notices that Gabby and Leena, who usually struggle with the academic tasks in the class, are using the maps in their textbook to complete the assignment. They also appear to be cooperating with one another to get the assignment done. Mr. Miller walks over to the girls and looks over their work. While standing in front of their desks he says, "I like the way you are using the text to help you locate the capitals, but it looks like you are spelling several of the capitals wrong. You want to make sure to spell each word correctly so that you study the right words. You also know Mrs. Johnson expects the very best."

What went wrong?	*What would you do differently?*

Scenario 4: *Write your own scenario in which something "goes wrong."*

What went wrong?	*What would you do differently?*

APPENDIX H

BSP SELF-ASSESSMENT

True/False:

1. BSP an evidence-based strategy that involves the paraeducator using words of affirmation or praise phrases when a student engages in appropriate behavior.	TRUE	FALSE
2. BSP is commonly used in classrooms.	TRUE	FALSE
3. BSP should be used to acknowledge both the process of learning and the final product produced by the student.	TRUE	FALSE
4. You should give students a few seconds of wait time after delivering a BSP.	TRUE	FALSE

Multiple Choice:

5. Which of the follow is an important step in delivering BSP?
    a. Stating the behavior the student is engaging in.
    b. Stating the BSP quickly so their learning is not interrupted.
    c. Delivering a prompt within 3 seconds of delivering the BSP.
    d. Engaging in a type of physical affirmation (ex: pat on back, high five)

6. BSP should be given using a _____: 1 ratio of BSP to corrections/reprimands.
    a. 2
    b. 3
    c. 4
    d. 5

7. Which of the following statement is the most effective OTR.
    a. "Nice job working hard on math."

b. “Thank you for that. It was very nice of you.”
c. “I like the way you are following the order of operations. Great remembering.”

APPENDIX I

BSP TRUE AND FALSE STATEMENTS

Students are more engaged when the rates of approval are high for both academic and social behavioral tasks.

Currently, BSP is used so much in classrooms that it is actually over-used.

The *only* benefit of BSP is that it builds student confidence.

There are 2 main types of praise: general praise and behavior specific praise.

You should only use BSP with the behaviors you would like to see used more frequently in the future.

When delivering a BSP you want to give the student a lengthy descriptive statement of what they were doing well.

Reinforcing the process behaviors is just as important as the product the student produces.

Process praise refers to praising the student for specific behaviors they engage in while completing the task.

Product praise refers to praising a student for a specific task they completed.

You must always say the student's name before giving the BSP statement.

Every BSP should state a praise/affirmation and a brief phrase identifying the behavior the student was doing well.

Using phrases like "working hard" and "paying attention" are the most effective BSPs.

It doesn't matter the tone in which you deliver the BSP, Just as long as you deliver a BSP.

You should deliver a BSP and correction at the same time.

When delivering BSP you should be cautious of the word, "but."

Giving a student a high five after stating the appropriate behavior the student engaged in is a BSP.

BSP has been proven to reduce off-task behavior.

In order for BSP to be effective you must use it at high rates and follow the correct steps.

General praise and BSP have been found to have the same affect on problem behavior.

APPENDIX J

OTR VIDEO RESPONSE

LOOK FOR: How do kids appear to feel when they respond?	
Whole Class/Technology	
Partner Work/Math	
Reading Aloud/Sentence	
Individual/Exit Ticket	
How do kids appear to feel when they respond?	

LOOK FOR: Student on and off task behavior	
Whole Class/Marker Board	
Whole Class/Thumbs	
Whole Class/Music	
Whole Class/Response Cards	
How does increasing OTR affect on-task behavior?	

LOOK FOR: The responsibility students appear to feel toward their learning.	
Whole Class/Think, Blow, Say	
Whole Class/Choral	
Whole Class/Numbers	
Whole Class/Mirroring	
Individual/Tic Tac Toe	
Whole Class/Voting	
How do OTR affect the responsibility children feel for their own learning?	

1. The video showed a variety of OTR. What types of OTR do you see used in your classrooms most often?

2. What kinds of OTR do you tend to use most often?

3. Discuss your role within the classroom in terms of OTR.

APPENDIX K

WHAT WENT WRONG?

Directions: Read each scenario, describe what part(s) of delivering an *effective OTR* went wrong, and explain what you would do differently.

Scenario 1:

During a 6th grade science class, Mr. Keegan, a paraeducator, sits at a table with three students who have IEPs. While the teacher presents instruction, Mr. Keegan likes to check in with his students to ensure they are learning the material being presented. As the teacher discusses earthquakes Mr. Keegan says, "Did you hear what he said? Were you listening? Earthquakes are powerful, sudden motions along breaks in the crust called faults. Your turn, what is a fault? Remember they are powerful."

What went wrong?	*What would you do differently?*

Scenario 2:

Mrs. Thomas, a 2nd grade paraeducator helps two students with their math work everyday in the learning support classroom. To begin the activity Mrs. Thomas makes eye contact with each student and says, "Billy and Sarah, I want you each to use addition to answer these problems by using the strategy we learned yesterday. When you finish that, I want you to do this (pointing to the backside of the worksheet). Now, remember what do we say when we subtract? We say 'When you subtract, it makes you go back!'"

What went wrong?	*What would you do differently?*

Scenario 3:

Mrs. Coupe, a paraeducator in Mr. Pine's 10th grade language arts class, is helping several students learn some vocabulary words. She first stops at Mike's desk and says, "Are we supposed to put a space in-between our sentences? Mr. Pine has reminded you about that since the first day of school." She then stops at Angela's desk, kneels down, looks her in the eye and says, "Remember collaborate means to work together with someone. Think of the story we just read, when did Bob and Brad collaborate?" Angela waits two seconds and then responds by saying, "When they were working their science project together." Mrs. Coupe replies, "Yes! Great job remembering those details. Try to think of that example when remembering what 'collaborate' means."

What went wrong?	*What would you do differently?*

Scenario 4: *Write your own scenario in which something "goes wrong."*

What went wrong?	*What would you do differently?*

APPENDIX L

OTR SELF-ASSESSMENT

True/False:

1. OTR is a strategy focused on improving students' behavior by decreasing the opportunity for the student to become off-task.	TRUE	FALSE
2. It is important to deliver only one OTR at a time.	TRUE	FALSE
3. There are three types of OTR: verbal, written, and gestural.	TRUE	FALSE
4. An OTR can be given in a variety of ways and using the strategy in different ways is encouraged.	TRUE	FALSE

Multiple Choice:

5. Which of the follow is an important step in delivering an OTR?

   a. Giving the students several choices to pick from.
   b. Ensuring that the student is given enough wait time to answer.
   c. Delivering a prompt within 3 seconds of delivering the OTR.
   d. Stating the student's name before asking a question.

6. When learning new material, teachers and paraeducators collectively should try to provide a minimum of how many OTR per minute?

   a. 1
   b. 2
   c. 3
   d. 4

7. Which of the following statement is the most effective OTR.

a. “Are you listening as Mrs. M reads?”
b. “When writing a sentence which word is always capitalized?”
c. “Look at the map and answer the questions.”

APPENDIX M

OTR TRUE AND FALSE STATEMENTS

You can deliver an OTR two different ways: through writing and verbalizations.

There is only one way to deliver an OTR.

Increasing the amount of OTR also helps increase the amount of active student engagement.

The main focus of an OTR is to evoke a behavioral response.

An OTR must require the student to respond to an academic question.

Delivering an OTR without first gaining a student's attention is ok, as long as you are within close proximity.

One way to gain a student's attention is by getting down to their level and making eye contact.

It is ok to deliver several OTR at one time if they are related in context.

When an OTR is given, you must wait at least 3 seconds before prompting, giving a directive, or asking another OTR.

General statements like "Do this" or "Are you learning this?" are great examples of effective OTR.

You should make sure to keep OTR clear and concise by avoiding excessive words and lengthy sentences.

A student can respond to an OTR by verbally answer or by writing their answer down.

It is recommended that students get 1-2 OTR per minute when learning new material.

You should only place one academic request on a student at a time.

When delivering an OTR you should maintain an assertive, yet calm and supportive affect.

It is ok to use sarcasm when delivering an OTR if it is an academic question that the student *should* know the answer to.

APPENDIX N

IMPLEMENTATION FIDELITY: DIDACTIC INSTRUCTION SESSIONS

1. Were all the necessary materials present and available? (PPT presentation, handouts, chairs, desks, video, writing utensils, etc.)	YES	NO
2. Were the participants provided with materials to associated with presentation?	YES	NO
3. Did the session include a PPT presentation?	YES	NO
4. Was the strategy's definition reviewed?	YES	NO
5. Was the strategy's importance review?	YES	NO
6. Were participants provided with examples and non-examples?	YES	NO
7. Were participants provided with an opportunity to see the strategy in action?	YES	NO
8. Did the presenter explain the specific steps in the strategy?	YES	NO
9. Were participants provided an opportunity to work with a partner?	YES	NO
10. Were the participants provided with an opportunity to engage in large group discussion?	YES	NO
11. Were the participants provided with an opportunity to engage in small group discussion?	YES	NO
12. Were the participants provided with an opportunity to work through real-life scenarios?	YES	NO
13. Were the participants provided with an opportunity to ask questions?	YES	NO
14. Were the participants given the opportunity to self-assess their learning?	YES	NO
15. Was the total didactic instruction session 180 minutes in duration?	YES	NO

Total out of 15 _____ / 14

Implementation Fidelity Percentage_____ %

APPENDIX O

IMPLEMENTATION FIDELITY: 10-MINUTE STRATEGY REVIEW

PERFORMANCE FEEDBACK

1. Were the participants provided with a handout to review?	YES	NO
2. Were the participants given a minimum of one minute to review the handout?	YES	NO
3. Did the PI describe the content on the handout?	YES	NO
4. Was the participant provided with an opportunity to ask a question?	YES	NO
5. Was the duration of the strategy review kept to 10 minutes?	YES	NO

Total out of 5 _____ / 5

Implementation Fidelity Percentage-_____ %

APPENDIX P

IMPLEMENTATION FIDELITY: PERFORMANCE FEEDBACK SESSIONS

1. Was the performance feedback session given within an hour of the observation?	YES	NO
2. Were a minimum of two of the participant's strengths reviewed?	YES	NO
3. Were a minimum of two of the participants' areas for improvement reviewed?	YES	NO
4. Was the participant provided with a graph of their progress?	YES	NO
5. Was the participant provided with an opportunity to ask a question?	YES	NO
6. Was the duration of the performance feedback session kept to five minutes? (range 4:15-5:45)	YES	NO

Total out of 6_____ / 6
Implementation Fidelity Percentage-_____ %

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